coastal zone management in the metropolitan new orleans region

urban studies institute
university of new orleans

Louisiana State Planning Office

COASTAL ZONE MANAGEMENT IN THE METROPOLITAN NEW ORLEANS REGION

by

Anthony J. Mumphrey, Jr., Ph.D., P.E., A.I.P.
Associate Professor of Urban and Regional Planning
Project Director

H. Wade VanLandingham, M.U.R.P.
Research Associate

Alma H. Young, M.S.
Research Associate

Edwin J. Durabb, B.S., Assoc. A.I.P.
Graduate Research Assistant

Urban Studies Institute

University of New Orleans

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ABSTRACT

The New Orleans metropolitan region, which is comprised of Jefferson, Orleans, St. Bernard, and St. Tammany Parishes, is located within the Louisiana Coastal Zone. Much of the region's land area is wetland. Since these wetlands are an integral part of the ecologic-economic system of Louisiana and largely influence the lifestyle of the region, the parishes of the metropolitan region and the State of Louisiana realize that careful wetlands management is essential. In line with this, the parishes are presently in various stages of developing coastal zone management (CZM) plans for their areas. This study is meant to provide the parishes information which will facilitate the formulation of these plans.

In Chapter 1, a CZM directory of resource persons who may be of assistance in the preparation of local CZM plans is presented. The directory (for which names and addresses are presented in the Appendix 1.1) is subdivided into three main categories: 1) technical experts in coastal studies; 2) special interest groups which are major users of the coastal zone; and 3) general interest groups comprised of those persons who participate in coastal activities on a more ad hoc basis.

Current coastal activities, uses, and management efforts are discussed in Chapter 2. The first part of the chapter describes coastal uses and activities such as residential, commercial, and industrial land uses; recreation; flood

control; navigation canals; water quality and wastewater treatment; and others. The ecosystem impacts of these uses and activities are also considered. The second part of the chapter presents an overview of the parishes' CZM efforts. The Appendix 2.1 contains an annotated bibliography of the parishes' coastal management and planning documents.

Using the planning technique known as the planned requirements approach, Chapter 3 projects the amount and location of various categories of land use by parish within the region for the years 1980 and 1985. Land use allocations to the parishes are made on the basis of employment, population and density projections, opinions of experts in the parishes, existing and projected transportation infrastructure in the region, project housing costs, existing land available for development, the existing locations of business and industry, and other factors.

Chapter 4 describes the processes through which various types of projects are initiated, approved, and carried through to the implementation stage. The types of projects discussed are those that involve extraction of minerals, transportation, and reclamation of wetlands.

In Chapter 5, a model for state coastal zone management plans is developed. The progress in developing CZM plans for each parish is outlined. Following that, the existing parish CZM plans are described and compared to the model as well as to the proposed Louisiana Coastal Resources program.

The purpose for presenting this information is that it should be integrated into local coastal management efforts in the New Orleans metropolitan region. Hopefully it will make developing of CZM plans a less arduous task and will result in improved planning for the use of the region's coastal resources.

PREFACE

In completing this study, the authors' intention is to provide information of several dimensions for use in the development of Coastal Zone Management Plans in the parishes of the metropolitan New Orleans region--Jefferson, Orleans, St. Bernard, and St. Tammany. The study is intended to lead to judicious utilization of the resources in the Louisiana coastal zone.

Many people assisted in the preparation of this study and they are listed in the references presented throughout the text. Included are persons at each the four parishes' planning agencies; at the Regional Planning Commission for Jefferson, Orleans, St. Bernard, and St. Tammany Parishes; and other individuals in public and private agencies and firms. Lynne Hair and James Renner of the State Planning Office (SPO) provided technical and administrative coordination between the SPO and the Urban Studies Institute. The authors wish to express their gratitude to all those who provided valuable assistance.

A.J.M., Jr.
Urban Studies Institute
University of New Orleans
August, 1976

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CHAPTER 1

A CZM RESOURCE DIRECTORY

IMPORTANCE OF PUBLIC PARTICIPATION

The purpose of this chapter is to provide parish governments in the New Orleans Standard Metropolitan Statistical Area (SMSA)--Orleans, Jefferson, St. Bernard and St. Tammany--with a resource directory of local individuals and groups who are interested and influential in the coastal zone and may be of assistance in the preparation of local coastal zone management plans. The directory is divided into three categories: (1) technical experts, comprised of heads of federal and state agencies which are located within the parishes, academics and researchers, and planners in the area; (2) special interest groups, comprised of major users of the coastal zone, including advocates for development and for preservation or conservation; and (3) general interest groups, comprised of those who participate in coastal activities on a more *ad hoc* basis. The directory will enable local officials to identify individuals who may assist them develop a coastal zone management plan by providing ideas and feedback.

The federal Coastal Zone Management Act of 1972 (U.S. Congress, 1972) established a national policy to preserve, protect, develop, and, where possible, to restore coastal resources. It provided funds enabling 30 states to develop and administer qualifying programs. The law requires public participation in coastal zone management programs. Section 303 of the Coastal Zone Management Act of 1972 states "that it is the national policy to encourage the participation of the public...in the development of a Coastal Zone Management program". The Act requires that open public hearings be held prior to any plan approval, with public notice given 30 days prior to the hearing, and that all pertinent agency material be made available for public review during that time (section 1454).

The Louisiana State Planning Office (SPO) also recognizes the need for public participation in the development of a coastal zone management (CZM) program. SPO would urge local governments developing a CZM program to provide a "full opportunity for public participation and involvement of interested persons" (State Planning Office, 1976). In developing its own CZM program, the state encouraged public participation by holding a series of public meetings throughout the state (<u>Cote de la Louisiane</u>, 1975).

Public participation can be of immense assistance to local governments in developing a CZM program. "Through citizen involvement...public needs and aspirations can be reflected in use decisions for the coastal zone and public support for the management program can be generated" (National Oceanic Atmospheric Administration as cited in Shabman, 1974: 197). Without the involvement of a broad range of public groups, the local governments may find themselves working in a vacuum, developing programs that are neither feasible for their constituents nor capable of being implemented.

To avoid working in isolation, local governments need to facilitate communication between themselves and the public. The more information a government official has, the more alert he is to alternatives and consequences (Shabman, 1974: 199). The first step in this process of facilitating communications is to bring to the attention of large segments of the public the importance of developing a CZM program. A recent study of Louisiana residents showed that only a small percentage of respondents expressed an awareness of current environmental planning. Only about 21 percent felt ecological problems represented an immediate area of concern for the coastal areas (Pinkey and Paterson, 1976).

Local governments should encourage citizen input at three stages in the development of the CZM program (Roy Mann Associates, 1975: 119-124). The first stage, that of pre-planning, is important in terms of engendering public confidence. Pre-planning also figures in the recording of factual information on resource supply and public demand. Planners can also use this opportunity to inform the public of their preliminary intentions.

In order to elicit citizen input at the pre-planning stage, several tools can be used: public opinion polls or questionnaires, which tend to be expensive; citizens' advisory committees, which can result in under-representation or important groups; use of the media, which provides one-way communication yet can increase the awareness of large groups of people; and public meetings, which encourage two-way communication between planners and interested citizens.

The second stage of citizen input is the planning stage. Fewer members can participate at this working stage when the actual plan is being developed. Those who do participate should fully represent the coastal zone constituency. The tools used at this stage can include workshops and public meetings, at which groups meet with planners to discuss alternatives and strategies. The planning stage should coincide with the process steps of performing a resource inventory, evaluating identified resources and determining the compatibility of these resources with resource use and development.

The third is the post-plan commentary stage, during which the public is invited to review the plan and to provide further input before the final plan is adopted. The tools used at this stage can include public hearings, follow-up public meetings, and public review of draft documents in conjunction with public meetings.

Care must be taken that the public does not think that input is limited to elites, or is too exclusive. The first step in eliciting public participation is to define the coastal zone constituency as broadly as possible. One wants to define the coastal zone constituency in its broadest sense so as "to reduce the more extreme cases of inequitable distribution of costs and benefits" among the coastal user groups. In other words, one wants to ensure social equity among the groups (Deckert and Sorensen, 1974: 42). To ensure social equity, one needs to:

1) define the composition of interest and socioeconomic groups within the coastal zone; and

2) motivate all groups, especially the unorganized groups that will be affected by a coastal program, to participate in the development of a coastal zone program.

A DESCRIPTION OF THE RESOURCE DIRECTORY

The entries in the resource directory were obtained from a variety of sources. It began with a preliminary list of individuals and groups interested in the coastal zone taken from <u>Survival in the City: An Urban/Environmental Resource Directory</u> (Wagner, 1976). Key persons on that preliminary list were then asked for names of individuals and groups that they know to be interested in the coastal zone. The chief planner in each parish was asked to identify individuals and user groups whose input he consiered vital in developing a CZM plan.

The resource directly is divided into three categories: technical experts, special interest groups and general interest groups (see Appendix 1.1).

Technical Experts

At present none of the four parishes has a CZM program and, therefore, has no centralized body which handles all aspects of the coastal zone. Instead, various agencies are responsible for regulating different aspects of the environment (New Orleans City Planning Commission, 1975: 39-52). The staff of the federal and state agencies that are located within the region and deal specifically with the coastal zone are listed. Also included in this category are academics, researchers and consultants who have been involved in research on the coastal zone. The official parish planners in the region are also included.

Special Interest Groups

Interest groups that make major use of the coastal zone have been identified from the names suggested by the parish planners during interviews with them, from the interest groups suggested by HB 1315 (1976) for representation on the proposed Louisiana Coastal Commission, and those listed by the State Planning Office in its Proposed Coastal Resources Management Statute (March 1976). Also used is information provided by the Louisiana Advisory Commission (1973) in its inventory of Louisiana's Coastal Zone. The aim is to provide a list that is as broad-based as possible, including those who favor minimal limitations on the use of coastal resources as well as those who advocate a conservationist or preservationist policy. The assumption is that conflict is an integral aspect of CZM and any coastal zone program will reflect a compromise of the wishes of the user groups (Mogulof, 1975).

The list includes:

A. Environmental Groups--These groups have proven themselves strong enough to be able to stop major projects in their implementation stage if the projects were considered to have a potentially negative impact on the environment.

B. Commercial Fishing/Trapping--In 1974, the total landed value of commercial fisheries in Louisiana was $86,694,000, representing a total catch of 1,228.9 million pounds (U.S. Department of Commerce, 1975: 18). Commercial fishing employs approximately 13,000 people (U.S. Department of Commerce, 1975: 76).

   In 1974, fur, hide and meat taken in the coastal zone amounted to approximately $8.9 million (Louisiana Wildlife and Fisheries Commission, 1975).

C. Sport Fishing, Hunting and Outdoor Recreation--In 1970, sport fishermen in Louisiana landed about 60,443,755 pounds of fish (Mumphrey et al., 1975: 108).

   In the four parishes, 48,620 hunting licenses and 52,304 fishing licenses were issued during the 1970-71 season (Mumphrey et al., 1975: 111).

D. Seafood Restaurants--No one has estimated how much of New Orleans' tourism is dependent upon its nationally acclaimed seafood restaurants, but it is assumed to be considerable.

E. Agriculture and Forestry--Louisiana's coastal zone has 10.8 million acres with 3.6 million acres suitable for farming. In 1972, the agricultural products of rice, soybeans, sugar cane and beef cattle brought in $240.3 million. Soybeans brought St. Tammany $66,200; beef cattle brought Jefferson $157,500, St. Bernard $60,000, and St. Tammany $580,000 (Louisiana Advisory Commission, 1973: 38, 43).

F. Ports and Shipping--In 1974, the New Orleans port, the second largest in the United States in tonnage handled, accounted for 7.7 million tons of general cargo (Board of Commissioners, Port of New Orleans, 1974: 12).

G. Shell Dredging and Sand--In 1970, shells in Louisiana had a retail value of $18 million. In 1970, sand in Louisiana had a retail value of $8.2 million. About 45 percent of the sand produced in the coastal zone parishes comes from the five parishes bordering on Lake Pontchartrain (Louisiana Advisory Commission, 1973: 53,55).

H. Realtors, homebuilders association, and land developers--The many new developments being planned and built in the region, such as Orlandia and Beau Chene, attest to the important role that these groups have assumed within the parishes.

I. Commercial and Industrial Interests--Industrial investment in the New Orleans area increased by 104 percent from 1969 to 1973. Commercial office space added during the past five years advanced by 83 percent in the New Orleans area, while commercial shopping center space grew by 52 percent (Economic Development Council, 1974: 1).

J. Oil and Gas--An estimated 47 oil or gas pipelines pass through the wetlands in the parishes of Orleans, Jefferson and St. Bernard (Mumphrey et al., 1975: 85).

In 1974, gas and oil pipe line companies in Louisiana were assessed $480.5 million by the Louisiana Tax Commission. In 1975, these companies were assessed $491.5 million (Louisiana Tax Commission, 1976: 10, 102).

General Interest Groups

This category includes groups that are not as directly involved in the coastal zone as those in category II, but who would nonetheless be affected by the ramifications of such a policy.

A. Minorities have tended not to become involved in environmental issues. But in developing a coastal zone program, there are aspects that would involve them. For instance, will the program result in more or fewer jobs in the coastal zone; will there be greater or less public access to the beaches and scenic areas along the coastal zone. Also, coastal zone regulation tends to drive up the value of existing residential units, making them less accessible to minority and poor occupants (Mogulof, 1975: 35).

B. Good Government Advocates would want to ensure that any CZM plan contains the attributes of "efficiency, equity, comprehensiveness and implementability" (Bobo, Mumphrey, and VanLandingham, 1976: 45).

C. Media personnel can be of great assistance to local officials in educating the general public about the need for a CZM plan and the ways in which they can become involved.

D. General Public includes persons who have shown an interest in environmental matters.

E. Community/Consumer Groups--Spokesmen for these groups are able to offer basic, "grassroots" information on how their constitutents use the resources of the coastal zone.

APPENDIX 1.1

CZM RESOURCE DIRECTORY

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By Category

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By Parish

SPECIAL INTEREST GROUPS

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By Category

I. Technical Experts

A. Academics in Marine Research*

Barry J. Baroni
(J.D., Loyola University of the South; LL.M., Tulane University)
Associate Professor, Department of Management and Marketing
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x481
Interest Categories: 8, 17**

John L. Fischer
(Ph.D., Harvard University)
Professor, Department of Anthropology
Tulane University
New Orleans, Louisiana 70118 504-865-5336
Interest Categories: 10, 16

Earl J. Hedrick, Jr.
(M.L.A., Harvard University)
Associate Professor, Urban Studies Institute
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x277

Frank L. Keller
(Ph.D., University of Maryland)
Professor, Department of Economics
Tulane University
New Orleans, Louisiana 70118 504-865-5321
Interest Categories: 7, 19

John L. Laseter
(Ph.D., University of Houston)
Professor/Chairman, Department of Biological Sciences
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x307
Interest Category: 22

Victor J. Law
(Ph.D., Tulane University)
Professor, Department of Chemical Engineering
Tulane University
New Orleans, Louisiana 70118 504-865-4181
Interest Categories: 1, 3, 15

Peggy A. Lentz
(Ph.D., Clark University (Massachusetts))
Assistant Professor, Urban Studies Institute
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x 277
Interest Category: 10

Leonard B. Lipson
(Ph.D., University of Texas, Austin)
Special Lecturer, Department of Management and Marketing
University of New Orleans
New Orleans, Louisiana 70122 504-523-2145
Interest Categories: 6, 17, 21

Anthony J. Mumphrey, Jr.
(Ph.D., University of Pennsylvania)
Associate Professor, Urban Studies Institute
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x277
Interest Categories: 10, 17, 19

Chester A. Peyronnin, Jr.
(M.S., Illinois Institute of Technology)
Professor, Department of Mechanical Engineering
Tulane University
New Orleans, Louisiana 70122 504-865-6176
Interest Categories: 14, 17, 21

Michael A. Poirrier
(Ph.D., Louisiana State University)
Associate Professor, Department of Biological Sciences
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x310
Interest Category: 4

Edwin P. Russo
(Ph.D., Louisiana State University)
Associate Professor, Department of Engineering
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x327
Interest Categories: 11, 12, 13, 17

Ralph E. Thayer
(Ph.D., University of Pittsburgh)
Associate Professor/Director, Urban Studies Institute
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x277
Interest Categories: 9, 10, 17, 18, 19

Fredrick W. Wagner
(Ph.D., University of Washington)
Assistant Professor, Urban Studies Institute
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x277
Interest Categories: 19, 20, 23

George W. Webb
(M.S., Columbia University)
Associate Professor, Department of Electrical Engineering
Tulane University
New Orleans, Louisiana 70118 504-865-4411
Interest Categories: 11, 17

*Source:
The Center for Wetlands Resources (1975) Marine Research Interest in Louisiana Universities. Baton Rouge, Louisiana: Louisiana State University.

**Categories of interest:
1. Aquaculture--Crustaceans
2. Aquaculture--Finfish
3. Aquaculture--Mollusks
4. Biological Oceanography
5. Pathology of Marine Organisms
6. Mineral Resources
7. Marine Economics
8. Ocean Law
9. Recreation
10. Socio-Political Studies
11. Vehicles, Vessels and Platforms
12. Materials and Structures
13. Coastal Engineering
14. Dredging
15. Commercial Fisheries--Technology
16. Man-in-the-Sea
17. Ports, Harbors, and Offshore Terminals
18. Transportation Systems
19. Coastal Zone Management--Social Studies
20. Coastal Zone Management--Natural Sciences and Engineering
21. Ecosystems Research
22. Pollution--Oil Spills
23. Pollution--Other
24. Environmental Models--Physical Processes

H. Wade VanLandingham
(M.U.R.P., University of New Orleans)
Research Associate, Urban Studies Institute
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x277

Alma H. Young
(M.S., Columbia University)
Research Associate, Urban Studies Institute
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x277

Gino D. Carlucci
(B.A., Georgetown University)
Research Assistant, Urban Studies Institute
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x277

Edwin J. Durabb
(B.A., Louisiana State University)
Research Assistant, Urban Studies Institute
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x277

Sharon Tusa Halperin
(B.A., University of New Orleans)
Research Assistant, Urban Studies Institute
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x277

Martha J. Landry
(B.S., Nicholls State University)
Research Assistant, Urban Studies Institute
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x277

John C. Miller
(B.A., Louisiana Tech University)
Research Assistant, Urban Studies Institute
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x277

Stephen D. Villavaso
(M.U.R.P., University of New Orleans)
Research Assistant, Urban Studies Institute
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x277

John S. Waterman
(M.A., University of New Orleans)
Research Assistant, Urban Studies Institute
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x277

Thomas B. Whalen
(B.S., Centenary College)
Research Assistant, Urban Studies Institute
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x277

Other individuals to contact:

Lydia M. Frenzel
(Ph.D., University of Texas at Austin)
Assistant Professor, Department of Chemistry
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x311

Mary L. Good
(Ph.D., University of Arkansas)
Boyd Professor of Chemistry
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x311

John U. Hidalgo
Engineering Sciences Environmental Center
School of Engineering
Tulane University
New Orleans, Louisiana 70118 504-865-6105

J. Walter Mason
(D. Sc., Tulane University)
Department of Environmental Health Sciences
Tulane Riverside Research Laboratories
Belle Chasse, Louisiana 70037 504-394-2233

Joel E. Massey
Department of Environmental Health Technology
Division of Allied Health
Delgado Junior College
New Orleans, Louisiana 70119 504-486-7393 x283

William Wesley Shaw
(Ph.D., Princeton University)
Professor, Urban Studies Center
Tulane University
New Orleans, Louisiana 70118 504-865-6131

William K. Turner
(M. Arch., University of Pennsylvania)
Professor/Dean, School of Architecture
Tulane University 6823 St. Charles Avenue
New Orleans, Louisiana 70118 504-865-6472

B. Federal, State, and Parish Agencies Located in the Region--
Field Agents

Federal Agencies

U.S. Army Corps of Engineers
New Orleans District Office
Colonel Early J. Rush III
Robert Buisson, Environmental Section
Charles Decher, Permitting Section
P.O. Box 60267
New Orleans, Louisiana 70160 504-865-1121

U.S. Coast Guard
Captain of the Port, Marine Environmental Protection Department
Lieutenant H.N. Young
Paul Dicharry, Environmental Impact
4640 Urquhart Street
New Orleans, Louisiana 70117 504-527-7171

U.S. Department of Agriculture Extension Service, Parish Agents

Jefferson
George Queen
P.O. Box 9160
Metairie, Louisiana 70001
504-436-4054

Kermit Braud
Room 820, Courthouse
Gretna, Louisiana 70053
504-367-6611

Orleans
William Green
315 Camp Street
New Orleans, Louisiana 70130 504-524-1131

St. Tammany
Billie Mussell White
Route 4, Box 188 A-1
Covington, Louisiana 70443 504-892-4917

St. Bernard
Luke Provenzano
Parish Courthouse, Room 305
Chalmette, Louisiana 70043 504-279-9402

U.S. Department of Agriculture, Forest Service
Southern Forest Experiment Station
Dr. John C. Barker
701 Loyola Avenue
New Orleans, Louisiana 70113 504-589-6800

U.S. Department of Agriculture, Soil Conservation Service
Daniel W. Clement
(Jefferson, St. Bernard and Orleans)
AAA Building
North Causeway Boulevard
Metairie, Louisiana 70002 504-831-3211

Lionel Hinchee
(St. Tammany)
P.O. Box 159
Covington, Louisiana 70043 504-892-0853

U.S. Department of Commerce
National Marine Fisheries
Southeast Regional Office:
William H. Stevenson
Duval Building
9450 Gandry Boulevard N.
St. Petersburg, Florida 33702 813-826-3141

New Orleans Office:
Edward J. Barry, Marketing News Reporter
Orville M. Allen, Fisheries Statistics
546 Carondelet
New Orleans, Louisiana 70130 504-589-6151

U.S. Department of Housing and Urban Development
Community Planning and Development Division
Thomas J. Armstrong
1001 Howard Avenue
New Orleans, Louisiana 70113 504-589-2487

U.S. Department of the Interior
Bureau of Land Management
New Orleans Outer Continental Shelf Office
John Rankin
Suite 841
Hale Boggs Federal Building
600 Camp Street
New Orleans, Louisiana 70113 504-837-4720

Bureau of Outdoor Recreation
John Coutcher, Director
Washington, D. C. 20240 202-343-5741

Fish and Wildlife Service
Division of Law Enforcement
Lawrence C. Wills
546 Carondelet Street, Room 100
New Orleans, Louisiana 70130 504-589-2334/504-589-2692

U.S. Department of Transportation
Federal Highway Administration
Morris Reinhardt, Director
750 Florida Avenue
Baton Rouge, Louisiana 70815 504-387-0181

U.S. Environmental Protection Agency
Lower Mississippi River Facility
NASA Test Facility, Bay St. Louis, Mississippi
Thomas F. Beckers
P.O. Drawer N
Slidell, Louisiana 70458 601-688-2265
New Orleans, Louisiana 504-822-4190 x2265

U.S. Environmental Protection Agency
Environmental Monitoring Support Laboratory
Las Vegas Land and Water Quality Field Investigation
James Butch, Director
6130 Renoir Drive
Baton Rouge, Louisiana 70815 504-924-1381

State Agencies

Louisiana Air Control Commission
James F. Coerver
P.O. Box 60630
New Orleans, Louisiana 70160 504-527-5115

Louisiana Conservation Department (Oil and Gas Only)
Benjamin F. Walsh, Manager
William Clark, District Engineer
325 Loyola Avene
New Orleans, Louisiana 70112 504-527-8404

Louisiana Commission on Intergovernmental Relations
Donna Irvin
300 Louisiana Avenue
Baton Rouge, Louisiana 70815 504-389-5664

Louisiana Department of Commerce and Industry
Richard Guthrie
International Trade Mart
New Orleans, Louisiana 70130 504-527-5401

Louisiana State Forestry Commission
James Nixon, State Forester
D.L. McTatter, Associate
5150 Florida Boulevard
Baton Rouge, Louisiana 70815 504-389-7121

Louisiana State Attorney General
Environmental Protection Unit
Richard Troy
234 Loyola Avenue, Seventh Floor
New Orleans, Louisiana 70112 504-527-8375

Louisiana State Department of Agriculture
Gilbert L. Dozier, Director
325 Loyola Avenue
New Orleans, Louisiana 70112 504-527-8204

Louisiana State Department of Public Works
Engineering Division
Roy Aguillard, Director
7252 Lakeshore Drive
New Orleans, Louisiana 70122 504-527-5630

Louisiana State Division of Health
Environmental Health Bureau
James F. Coerver
David Bruce, Environmental Planner
325 Loyola Avenue
New Orleans, Louisiana 70112 504-527-5111

Louisiana State Highway Department
District 02 Headquarters
James McCrew, District Engineer
P.O. Box 9179
New Orleans, Louisiana 70094 504-347-7361

Louisiana State Parks and Recreation Commission
Gilbert C. Lagasse, Director
P.O. Drawer 1111
Baton Rouge, Louisiana 70821 504-389-5761

Louisiana State Parks and Recreation Commission
Bureau of Outdoor Recreation
Gilbert C. Lagasse, Liaison Officer
W. Edwin Martin, Executive Assistant
625 North 4th Street
Baton Rouge, Louisiana 70815 504-389-5886

Louisiana Stream Control Commission
Robert A. Lafluer
P.O. Drawer FC
Baton Rouge, Louisiana 70803 504-389-5300

Louisiana Wildlife and Fisheries Commission
J. Burton Angelle, Director and Secretary
Lyle St. Amant, Assistant Director
400 Royal Street
New Orleans, Louisiana 70130 504-527-5126

Offshore Terminal Authority (Superport)
Shepard A. Perrin
International Trade Mart
New Orleans, Louisiana 70130 504-568-4678

Tourist Development Commission
Mrs. Gayle Burchfield, Regional Manager
334 Royal Avenue
New Orleans, Louisiana 70130 504-529-2906

Catherine Frierson
Interstate 59
Slidell, Louisiana 70458 504-643-4646

Parish Agencies

New Orleans/Orleans Parish

Agricultural Extension Service, Orleans Parish
Bill Green
c/o Chamber of Commerce
301 Camp Street
New Orleans, Louisiana 70130 504-524-1131

Department of Safety and Permits
Edward C. Kurtz, Director
City Hall, Room 7E05
1300 Perdido Street
New Orleans, Louisiana 70112 504-586-4412

Department of Sanitation
Landfills:
Tony Stant
City Hall, Room 2W13
1300 Perdido Street
New Orleans, Louisiana 70112 504-586-4209

Mosquito Control:
George Carmichael
6601 Lakeshore Drive
New Orleans, Louisiana 70122 403-241-2370

Department of Streets
Blaise Carriere, Director
City Hall, Room 6W02
1300 Perdido Street
New Orleans, Louisiana 70112 504-586-4511

Department of Utilities
F.L. Schmitt
City Hall, Room 2W14
1300 Perdido Street
New Orleans, Louisiana 70112 504-586-4625

New Orleans Recreation Department
Wally LeGrass
705 Lafayette Street
New Orleans, Louisiana 70130 504-586-4461

Office of Consumer Affairs
Nel Weekly
City Hall, Room 1W12
1300 Perdido Street
New Orleans, Louisiana 70112 504-586-4441

Orleans Levee Board
John McNamara
418 Royal Street
New Orleans, Louisiana 70130 504-523-5042

Parkway and Park Commission
Mildred Fossier, Superintendent
2829 Gentilly Boulevard
New Orleans, Louisiana 70122 504-943-6623

Sewerage and Water Board of New Orleans
Stuart Brehn, Mr.
City Hall
1300 Perdido Street
New Orleans, Louisiana 70112 504-586-4588

Jefferson Parish

Agricultural Extension Service
Kermit Braud
Room 820
New Gretna Courthouse
Gretna, Louisiana 70053 504-367-6611

Department of Drainage and Sewerage
R.L. Condon, Director
648 Helios Avenue
Metairie, Louisiana 70002 504-834-7810

Department of Recreation
Emile A. Davidson
1521 Palm Street
Metairie, Louisiana 70001 504-831-1321

Department of Roads and Bridges (incl. Engineering Division, Park & Parkway Division)
Paul W. Marcotte, Director
1901 Ames Boulevard
Marrero, Louisiana 70072 504-340-5201

Department of Safety
Dennis DeVun
3330 North Causeway Boulevard
Metairie, Louisiana 70002 504-834-7700

Lafourche Levee Board (West Bank)
Sterling Robichaux, President
P.O. Box 190
Donaldsonville, Louisiana 70346 504-473-9852

Mosquito Control Department
Glenn M. Stokes, Director
118 David Drive
Metairie, Louisiana 70002 504-733-0163

Pontchartrain Levee Board
John Lauricella, President
5333 River Road
Harahan, Louisiana 70123 504-733-0087

Water Board
Peter Russo, Director
3600 Jefferson Highway
Jefferson, Louisiana 70123 504-837-1070

Zoning Appeals Board
John Flynn, Chairman
New Gretna Courthouse
P.O. Box 9
Gretna, Louisiana 70053 504-367-6611

St. Bernard Parish

Engineers
Thomas Reed
Courthouse Annex
Chalmette, Louisiana 70043 504-279-5293

Lake Borgne Levee Board
Raymond Willhost, President
Violet, Louisiana 70092 504-682-5941

Mosquito Control Department
Will Schulte
2004 Palmisano Avenue
Chalmette, Louisiana 70043 504-279-8559

Recreation Department
Edward Heider
Courthouse
Chalmette, Louisiana 70043 504-271-6818

Road District Office
Safety and Permits
Jack A. Stephens
Courthouse Annex
Chalmette, Louisiana 70043 504-279-5293

Sanitation Department
Clarence Robin, Superintendent
Paris Road
Chalmette, Louisiana 70043 504-279-8195

Sewerage District #1
Harold Felger
Sewerage District #2
Hilary Nunez
Courthouse Annex
Chalmette, Louisiana 70043 504-271-6404

Water District #1
Calvin Schenk
St. Bernard Highway
Chalmette, Louisiana 70043 504-271-1681
Water District #2
Sam Nicosia
St. Bernard Highway
East St. Bernard, Louisiana 504-682-5119

St. Tammany Parish

Mosquito Abatement, District #2
James Morrison
2800 Terrace Avenue
Slidell, Louisiana 70458 504-643-5050

Parish Engineer
Frank Uphoff
510 East Boston
Covington, Louisiana 70443 504-893-4363

Sewerage and Water Department
Joe Faciase, Superintendent
P.O. Box 828
Slidell, Louisiana 70459 504-643-3437

Sewerage Districts #6 and #4
c/o Police Jury Office
Courthouse
Covington, Louisiana 70443

Water District Board #2
Dr. R. L. Byron, Chairman
Abita Road
Covington, Louisiana 70443 504-892-8445

Water Works #3
Clyde Metz
109 North Drive
Covington, Louisiana 70443 504-892-2911

C. Official Planners in the Region

City Planning Commission, Parish of Orleans
Harold Katner
Randolph Clement
Ninth Floor, City Hall
1300 Perdido Street
New Orleans, Louisiana 70122 504-586-4751

Jefferson Parish Planning Department
Hugh N. Ford
330 North Causeway Boulevard, Suite 300
Metairie, Louisiana 70002 504-834-7700 x323

Regional Planning Commission
Leroy Dauterive
Barbara Phillips
333 St. Charles Avenue, Suite 900
New Orleans, Louisiana 70130 504-523-1432

St. Bernard Parish Planning Commission
Jack Stephens
Courthouse Annex
Chalmette, Louisiana 70043 504-279-6416

St. Tammany Parish Planning Department
Craig Sinden
Parish Court House, Suite M3
Covington, Louisiana 70433 504-892-4363

D. Consulting Engineers, Architects, and Planners

Raymond C. Bergeron, Jr., Director of Architecture
(B. Arch., Tulane University)
N-Y Associates, Inc.
2701 Kingman Street
Metairie, Louisiana 70002 504-885-0500

Louis C. Bisso, President
(B.S., Tulane Engineering)
Planning Services, Inc.
1100 Royal Street
New Orleans, Louisiana 70116 504-525-9052

Regel L. Bisso, Planner
(M.S., Tulane University)
Planning Services, Inc.
1100 Royal Street
New Orleans, Louisiana 70116 504-525-9052

Robert Bredberg, Senior Project Engineer
(B.S.C.E., Montana State University)
N-Y Associates, Inc.
2701 Kingman Street
Metairie, Louisiana 70002 504-885-0500

Dennis P. Butler
(M.S., Tulane University)
Burk and Associates, Inc.
4176 Canal Street
New Orleans, Louisiana 70119 504-486-5901
Fields of Interest: Water Quality Management, Fisheries Management

Reynaldo Cedillos
(M.E., University of Texas at El Paso)
URS/Forrest and Cotton, Inc.
3501 North Causeway Boulevard
Metairie, Louisiana 70002 504-837-6326
Fields of Interest: Waste Water Management

Mary G. Curry
(Ph.D., Louisiana State University)
V TN Louisiana, Inc.
2701 Independence Street
Metairie, Louisiana 70002 504-455-3881
Fields of Interest: Vascular Plant Taxonomy, Rare and Endangered Species

Thomas Haskings
(Ph.D., Texas A. & M. University)
URS/Forrest and Cotton, Inc.
3501 North Causeway Boulevard
Metairie, Louisiana 70002 504-837-6326
Fields of Interest: Environmental Engineering

William E. Knesal, Jr.
(B.S., Mississippi State University)
N-Y Associates, Inc.
2701 Kingman Street
Metairie, Louisiana 70002 504-885-0500

James E. Leeman
(M.E., Tulane University)
VTN Louisiana, Inc.
2701 Independence
Metairie, Louisiana 70002 504-455-3881
Fields of Interest: Water Resource Engineering

Neil D. Logan, Project Engineer
(B.S., Purdue University)
N-Y Associates, Inc.
2701 Kingman Street
Metairie, Louisiana 70002 504-885-0500
Fields of Interest: Sewer systems, water systems, and natural gas systems

H. John Losch, III, Project Engineer
(B.S., Louisiana State University)
N-Y Associates, Inc.
2701 Kingman Street
Metairie, Louisiana 70002 504-885-0500
Fields of Interest: Water supply and distribution, sewage collection and treatment, storm drainage and flood control

James Mayes
(Ph.D., Johns Hopkins University)
Gulf South Research Institute
5010 Leroy Johnson Drive
New Orleans, Louisiana 70122 504-283-4233
Fields of Interest: Industrial effluence and processes

Terence J. McGhee
(Ph.D., University of Kansas)
N-Y Associates, Inc.
2701 Kingman Street
Metairie, Louisiana 70002 504-885-0500
Fields of Interest: Sanitary engineering

H. Douglas Miller
(M.S., Tulane University)
Burk and Associates, Inc.
4176 Canal Street
New Orleans, Louisiana 70119 504-486-5901
Fields of Interest: Water and wastewater management, water quality analysis

Paviz Mojgani
(M.S., Tulane University; Ph.D. candidate, Tulane University)
URS/Forrest and Cotton, Inc.
3501 North Causeway Boulevard
Metairie, Louisiana 70002 504-837-6326
Fields of Interest: waste water management

Joseph Montalbo
(Ph.D., University of New Orleans)
Gulf South Research Institute
5010 Leroy Johnson Drive
New Orleans, Louisiana 70122 504-283-4233
Fields of Interest: Water pollution analysis

Herbert Moore, Director of Planning
(M.S., University of Tennessee)
N-Y Associates, Inc.
2701 Kingman Street
Metairie, Louisiana 70002 504-885-0500
Fields of Interest: Regional planning, regional transportation, zoning and air pollution control

Frank Nicoladis, President
(B.S., Mississippi State University)
N-Y Associates, Inc.
2701 Kingman Street
Metairie, Louisiana 70002 504-885-0500
Fields of Interest: Water and wastewater treatment, storm drainage systems, and natural gas systems

Jens Nielsen
(M.E., Tulane University)
Burk and Associates, Inc.
4176 Canal Street
New Orleans, Louisiana 70119 504-486-5901
Fields of Interest: Civil engineering; associate in charge of Environmental Division projects, Burk and Associates, Inc.

Gerald Powell
Real Estate Consultant
W.R. Smolkin and Associates
One Shell Square
New Orleans, Louisiana 70139 504-586-1771

Vincent Provenza
(B.E., Tulane University)
URS/Forrest and Cotton, Inc.
3501 North Causeway Boulevard
Metairie, Louisiana 70002 504-837-6326
Fields of Interest: Waste water treatment

James Ryan
(Ph.D., B.P.I.)
Gulf South Research Institute
5010 Leroy Johnson Drive
New Orleans, Louisiana 70122 504-283-4233
Fields of Interest: Water pollution analysis

Malcolm O. Sayes, Chief Engineer
(B.S., Louisiana State University)
N-Y Associates, Inc.
2701 Kingman Street
Metairie, Louisiana 70002 504-885-0500
Fields of Interest: Subsurface drainage systems, sewer, gas and water systems.

Gerald L. Schroeder, Jr., Project Engineer
(M.S., Tulane University)
N-Y Associates, Inc.
2701 Kingman Street
Metairie, Louisiana 70002 504-885-0500
Fields of Interest: Air pollution control, water and wastewater treatment, solid waste, water quality and water resources planning, and environmental planning

Mahmood Shariat
(M.S., Tulane University)
Burk and Associates, Inc.
4176 Canal Street
New Orleans, Louisiana 70119 504-486-5901
Fields of Interest: Water Quality and Chemistry

Peter M. Smith
(Dr. Sc., Tulane University
Burk and Associates, Inc.
4176 Canal Street
New Orleans, Louisiana 70119 504-486-5901
Fields of Interest: Water and wastewater research management, environmental planning and assessments

B. Ray Summerell
(B.L.A., Virginia Polytechnic Institute and State University)
Burk and Associates, Inc.
4176 Canal Street
New Orleans, Louisiana 70119 504-486-5901
Fields of Interest: Landscape Architecture

Paul D. Taylor
(M.S., Tulane University)
Burk and Associates, Inc.
4176 Canal Street
New Orleans, Louisiana 70119 504-486-5901
Fields of Interest: Water pollution, water quality

Kenneth E. Thomas, Project Engineer
(B.S., Pennsylvania State University)
N-Y Associates, Inc.
2701 Kingman Street
Metairie, Louisiana 70002 504-885-0500
Fields of Interest: Water supply and distribution, sewage collection and treatment, flood control, and storm drainage

Paul R. Wagner
(Ph.D., Louisiana State University)
Burk and Associates, Inc.
4176 Canal Street
New Orleans, Louisiana 70119 504-486-5901
Fields of Interest: Estuarine ecology and fisheries biology, ecological surveys

Ralph Wheeler
Gulf South Research Institute
P.O. Box 1177
West Admiral Doyle Drive
New Iberia, Louisiana 318-365-2411

Other firms to contact:

Dames and Moore
(Consultants in the Environmental and Applied Earth Sciences)
4450 General DeGaulle Drive
Algiers, Louisiana 70114 504-393-8440

Sizeler and Muller, Architects
William Sizeler
Stanley Muller
Suite 1700, Canal-LaSalle Building
New Orleans, Louisiana 70112 504-588-9248

Steimle, Smolley and Associates, Inc.
Dr. Steve Steimle
P.O. Box 73336
Metairie, Louisiana 70003 504-885-8488

II. Special Interest Groups

A. Environmental Groups

American Institute of Architects, New Orleans Chapter
Lem McCoy, Executive Director
J. Eean McNaughton, President
4418 Calliope Street
New Orleans, Louisiana 70152 504-821-5596/504-586-1870

American Lung Association of Louisiana, Inc.
W. Findley Raymond, Executive Director
333 St. Charles Avenue, Suite 1504
New Orleans, Louisiana 70130 504-523-5864

Audubon Society, Orleans Chapter
Frank P. Fischer, President
2720 Octavia Street
New Orleans, Louisiana 70115 504-482-9701/504-861-1807

Barry Kohler, Conservation Chairman
346 Audubon
New Orleans, Louisiana 70118 504-861-8465/504-521-6278

Cliff Danby
4843 Gabriel Drive
New Orleans, Louisiana 70127 504-242-4695

Ecology Center of Louisiana, Inc.
Ross Vincent, President
John Hammond, Vice-President
111 South Hennessey Street
New Orleans, Louisiana 70119 504-581-2287/504-482-8760
Mailing Address: P.O. Box 19344
New Orleans, Louisiana 70179

Friends of Lafitte Park
Frank Ehret, Jr.
5048 Ehret Road
Marrero, Louisiana 70072 504-341-1056

Fund for Animals
Sydney Rosenthal
4141 Veterans Memorial Boulevard
Metairie, Louisiana 70002 504-887-9222

Louisiana Chapter, American Institute of Planners
Anthony J. Mumphrey, Jr., President
Urban Studies Institute
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x277

Louisiana Historical Society
William von Trufant, President
Cotton Exchange Building
New Orleans, Louisiana 70130 504-588-2474

Louisiana Nature Center, Incorporated (educational)
Gary Schadle, President
One Shell Square, Suite 4100
New Orleans, Louisiana 70139 504-581-7017

Louisiana Wildlife Federation
Richard F. Stanel, Executive Director
P.O. Box 16089 LSU
Baton Rouge, Louisiana 70803 504-355-1871

Metropolitan New Orleans Section, American Institute of Planners
Raldolph Clement, Director
c/o New Orleans City Planning Commission
Ninth Floor, City Hall
1300 Perdido Street
New Orleans, Louisiana 70112 504-586-4751

Preservation Resource Center of New Orleans
Larry Schmidt
823 Perdido Street, Suite 200
New Orleans, Louisiana 70112 504-581-7017

Archaeologist
Mrs. John C. Chestnutt
158 Belle Terre Boulevard
Covington, Louisiana 70443 504-892-1003

St. Tammany Environmental Council
Ken and Martha Sollberger (138 Lafayette Street)
P.O. Box 644
Mandeville, Louisiana 70448 504-626-8293

St. Tammany Historical Society
Paula Johnson
Abita Springs, Louisiana 70420

Save Our Wetlands, Inc.
Luke Fontana
4821 Prytania Street
New Orleans, Louisiana 70115 504-897-0772

Sierra Club of New Orleans
Mrs. Joan Phillips, President
922 Octavia Street
New Orleans, Louisiana 70115 504-482/9701/504-482-8760

B. Commercial Fishing/Trapping

American Shrimp Canners Association
Anthony Cuccia, President
Cutcher Canning Company, Inc.
128 Sala Avenue
Westwego, Louisiana 70094 504-341-3439

The Bruno Family
Shortcut Road
Mandeville, Louisiana 70448

East Bank Fishermen Association
Milton Dudenhefer
Fort Pike (Rigolets), Louisiana 504-662-5795

Freddie Fandal
315 Marigny Avenue
Mandeville, Louisiana 70448 504-626-8217

Louisiana Oyster Dealers and Growers Association
Peter G. Vujnovich
2105 Decatur Street
New Orleans, Louisiana 70112 504-949-5443

Louisiana Shrimp Association
George Snow, President
1405 Jefferson Highway
Jefferson Parish, Louisiana 70123 504-834-2687

Robert Raymond, Trapper and Buyer
6100 Dorothea Street
New Orleans, Louisiana 70126 504-242-2473

St. Bernard Fishermen Association
Glen ("Duck") Couture
2118 Delille Street
Chalmette, Louisiana 70043 504-277-1847

Wallace Menhaden Products, Inc.
Jack T. Styron
1221 North Broad Street
New Orleans, Louisiana 70119 504-288-6657

C. Sport Fishing, Hunting and Outdoor Recreation

Byron Almquist, Manager
Canoe and Trail Shop
624 Moss Street
New Orleans, Louisiana 70115 504-488-8528

Barataria Bassmasters, Inc. (Jefferson Parish)
Leslie L. Cheramie, President
2748 Jimmie Dean Drive
Marrero, Louisiana 70072 504-341-1587

Duck Hunters (with Audubon Society)
John Bonck
501 Florida Boulevard
New Orleans, Louisiana 70122 504-488-7364

Ducks Unlimited, New Orleans Area
Ed Gueydon, President
Suite 1313
Pere Marquette Building
New Orleans, Louisiana 70112 504-581-2355

Iron Jaw Bassmasters (Jefferson Parish)
Antone J. "Tony" Kovach, President
422 Georgetown Drive
Kenner, Louisiana 70062 504-729-2952/504-581-9003

Jefferson Rod and Gun Club (Jefferson Parish)
Warren Bergeron, President
1104 Beechwood Drive
Harvey, Louisiana 70058
Permanent Address:
P.O. Box 23365
Harahan, Louisiana 70183

Kenner Sporting Club (Jefferson Parish)
Joe Schmolke, President
1905 34th Street
Kenner, Louisiana 70062

New Orleans Bass Masters (Orleans Parish)
David Schouest, President
3429 Caminada
Marrero, Louisiana 70072 504-347-2871

New Orleans Sportsmen's League (Orleans Parish)
Captain Lloyd A. Moreau, President
5420 Chamberlain Drive
New Orleans, Louisiana 70122 504-282-7187
Permanent Address of Club:
P.O. Box 30245
New Orleans, Louisiana 70190

St. Bernard Sportsmen's League (St. Bernard Parish)

Edward Hannan, President	Permanent Address:
13 Jamies Court	P.O. Box 1336
Violet, Louisiana 70092	Chalmette, Louisiana 70043

St. Tammany Sportsmen's League (St. Tammany Parish)

Henri F. Ferrer, President	Permanent Address:
Route 5, Box 31½	Route 5, Box 3½
Covington, Louisiana 70433	Covington, Louisiana 70433

Slidell Sportsmen's League (St. Tammany Parish)

Robert H. Merrell	Permanent Address:
110 West Pearl Dr., Route 1	P.O. Box 1208
Slidell, Louisiana 70458	Slidell, Louisiana 70458

D. Seafood Restaurants

Louisiana Restaurant Association
Billie Murrell
International Trade Mart Building
New Orleans, Louisiana 70130 504-581-1961

E. Agriculture and Forestry

Jefferson, St. Bernard-Plaquemines Farm Bureau
A. J. Phillips, President
Highway 45
Lafitte, Louisiana 70067 504-689-2185

Louisiana Farm Bureau
James Graunard, President
P.O. Box 15361
Broadview Station
Baton Rouge, Louisiana 70803

Louisiana Forestry Association (citizens' group)
William H. Matthews, Executive Director
P.O. Drawer 5067
Alexandria, Louisiana 71301 318-443-2558

St. Tammany Farm Bureau
Larry Catledge, President
Route 2, Box 56
Covington, Louisiana 70043 504-892-6436

Wood Unlimited (wood dealers and retailers)
Clark Cromwell, President
P.O. Box 66583
Baton Rouge, Louisiana
A.B. Clark Co.
8000 Oleander
New Orleans, Louisiana 70125 504-482-5733

F. Shipping and Ports

Board of Commissioners, Port of New Orleans
Edward S. Read, Executive Director
International Trade Mart
New Orleans, Louisiana 70130 504-522-2551

Louisiana Shipbuilding and Repair Association
A. J. Tatman, President
International Trade Mart, Suite 2936
New Orleans, Louisiana 70130 504-586-1155

G. Shell Dredging and Sand Companies

Shell Dredging

Ayers Materials Company, Inc.
P. O. Box 568
Harvey, Louisiana 70058 504-787-2255

Consolidated Materials, Inc.
Don Baxter, President
4200 Howard Avenue
New Orleans, Louisiana 70130 504-488-8741

Louisiana Materials Co., Inc.
Richard R. Murphy, President
P. O. Box 8214
New Orleans, Louisiana 70182 504-947-6681/504-366-3502

Pontchartrain Materials Corp.
George Douglas, President
1215 Hibernia Bank Building
New Orleans, Louisiana 70112 504-949-7571

Radcliff Materials, Inc.
E.B. Trice, President
P.O. Box 26396
New Orleans, Louisiana 70126 504-282-2561

Shell Producers Association
Burgess Thomasson, President
Radcliff Materials, Inc.
P. O. Box 26396
New Orleans, Louisiana 70186 504-282-2561

Sand

Chalmette Sand and Material
L. T. Murphy
1504 East St. Bernard Highway
Chalmette, Louisiana 70043 504-271-5985

George Kellett and Sons, Inc.
Percy Kellet, President
1330 Press Street
New Orleans, Louisiana 70117 504-945-1118

Louisiana Industries
William H. Dobson, Manager
5825 River Road
Harahan, Louisiana 70183 504-733-7330

Mississippi Valley Silica Company
Frank Bogran, President
324 East Boston
Covington, Louisiana 70443 504-892-4211/504-524-8849

H. Home Builders, Land Developers, and Realtors

Chateau Estates
E. C. Dorbin, President
3600 Chateau Boulevard
Kenner, Louisiana 70062 504-722-1351

Diamondhead Corporation
William Bru, President
4500 General DeGaulle Drive
New Orleans, Louisiana 70130 504-393-1500

Homebuilders Association of Greater New Orleans, Inc.
Lewis Stall, President
1639 Gentilly Boulevard
New Orleans, Louisiana 70122 504-943-3325

Jefferson Board of Realtors
Chuck Staub
4732 Utica Street
Metairie, Louisiana 70002 504-885-3200

JPT Land Corporation
Jules L. Rosenblum, President
Beau Rivage Subdivision
Slidell, Louisiana 70458 504-626-7819

Land and Royalty Owners of Louisiana
Urbain Burvant, Executive Director
Whitney Bank Building
New Orleans, Louisiana 70130 504-523-3701

New Orleans East, Inc.
Harold Cook
13232 Chef Menteur Highway/P.O. Box 29188
New Orleans, Louisiana 70189 504-254-1400

Rathbone Land Company
Henry Fair
Fourth Street
Harvey, Louisiana 70058 504-368-6335

Real Estate Board of New Orleans
Gertrude Gardner
826 Perdido
New Orleans, Louisiana 70130 504-943-3325

Richwood Homes
Joe Hodge
Tanglewood
Slidell, Louisiana 70458

Zollinger Company, Inc.
Lewis Zollinger
1458 North Broad
New Orleans, Louisiana 70122 504-949-4401

I. Commercial and Industrial Interests

Chamber of Commerce of Greater New Orleans
William G. McCullum, Chairman
Christopher Laborde, West Bank
Elias McColloster, Environmental Issues (x245)
301 Camp Street
New Orleans, Louisiana 70130 504-524-1131

Economic Development Council of the New Orleans Area
Tom Purdy, Director
Clement A. Cole, Manager, Industrial Development Department
Andrew F. Flores, Manager, Commercial Development Department
301 Camp Street
New Orleans, Louisiana 70130 504-524-1131

National Alliance of Businessmen
Gary W. December, Chairman
210 Legendre Drive
Slidell, Louisiana 70458 504-641-2035

New Orleans Board of Trade
Gilbert H. Vorhoff, President
316 Board of Trade Place
New Orleans, Louisiana 70130 504-525-3271

Young Men's Business Club of Greater New Orleans
John E. O'Shea, President
Braniff Place, Suite 209
New Orleans, Louisiana 70140 504-525-0747

J. Oil and Gas Producers

Louisiana Association of Independent Producers and Royalty Owners
Gilbert J. Sevier
Pere Marquette Building
New Orleans, Louisiana 70112 504-523-5764

Mid-Continent Oil and Gas
111 Thompson Building
Tulsa, Oklahoma 74103 918-582-5166
Vernon Dowdy, Louisiana Representative
Fidelity Bank Building, Suite 519
Baton Rouge, Louisiana 70801 504-387-3205

Petroleum Club of New Orleans
925 Common Street
New Orleans, Louisiana 70112 504-524-3203
Clarence W. Coffey, Sr., President
Chevron Oil
1111 Tulane Avenue
New Orleans, Louisiana 70112 504-521-6311

Offshore Operations Committee
P.O. Box 50751
New Orleans, Louisiana 70150
C.E. Galay
1111 Tulane Avenue
New Orleans, Louisiana 70112 504-521-6584

III. General Interest Groups

A. Minorities

Black Lawyers Association: Louis A. Martinette Society
Trevor G. Bryan, Secretary
Jefferson and Bryan
One Shell Square, Suite 3828
New Orleans, Louisiana 70139 504-561-8933

Comite Latino
Gary Aspiazu, President
2133 Kansas Avenue
Kenner, Louisiana 70062 504-722-4713

Irish Channel Action Foundation
Aubry Houze, Bilingual Program Chairman
1020 Hernandez Street
New Orleans, Louisiana 70130 504-523-5442

Latin American Apostolate (has list of Latin American clubs)
Father Robert Keenan, Director
821 General Pershing
New Orleans, Louisiana 70113 504-895-0395

League of United Latin American Citizens (LULAC)
Dr. Ernesto Rodriguez, Chairman
c/o Modern Languages Institute
1208 St. Charles Avenue
New Orleans, Louisiana 70130 504-529-4121

Mayor's Latin Advisory Committee (LAC)
Richard Arellano, President
c/o International Marketing Institute
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x279

NAACP, New Orleans Branch
Dyan French Cole, President
1821 Orleans Avenue
New Orleans, Louisiana 70116 504-821-4220

Perkins and James Architects
Robert Perkins
1661 North Claiborne Avenue
New Orleans, Louisiana 70117 504-944-0351

Urban League of Greater New Orleans
Clarence Barney, Executive Director
Millie M. Charles, Chairwoman, Board of Directors
(504-282-4401)
816 Howard Avenue
New Orleans, Louisiana 70113 504-523-6733

B. Good Government Advocates

Citizens Voter Education Association
George Ethel Warren
1836 Reynes Street
New Orleans, Louisiana 70127 504-944-8507 (home)

Common Cause
Dr. Sherwood Githens
3927 Camp Street
New Orleans, Louisiana 70118 504-899-5137/
504-288-3161 x307

Governor's Citizen Advisory Committee
Michael Maloney, Chairman
Whitney Bank Building, Suite 1100
228 St. Charles Avenue
New Orleans, Louisiana 70130 504-581-3333

Institue of Human Relations
David Boileau, S.J.
Loyola University
6363 St. Charles Avenue
New Orleans, Louisiana 70118 504-866-5411

League of Women Voters
Peggy Barnett, President: Orleans Parish Chapter
Charlotte Fremaux, President: Jefferson Parish Chapter
Marietta Herr (59 Oriole Street 504-283-2929)
1636 Toledano Street
New Orleans, Louisiana 70115 504-897-2062

Judy Zirkle, President: St. Tammany Parish Chapter
Covington, Louisiana 70443

Louisiana Center for the Public Interest
David Marcello, Director
921 Canal Street, Suite 1222
New Orleans, Louisiana 70112 504-524-1231/504-524-8182

Louisiana League of Good Government
Clara Antoine
1434 North Johnson Street
New Orleans, Louisiana 70116 504-949-8815

Florence Frazier
5812 Lafaye Street
New Orleans, Louisiana 70122 504-282-2510

Metropolitan Goals Foundation Program
Francis Keevers
Richard Dennery
1029 Maritime Building
203 Carondelet Street
New Orleans, Louisiana 70130 504-581-6355/504-521-3947

C. Media

Figaro
1070 St. Charles Avenue
New Orleans, Louisiana 70115 504-525-3628
Jerry Lipsick, Environmental Reporter

Jefferson Parish Times
P.O. Box 204
3033 North Causeway Boulevard
Metairie, Louisiana 70002 504-837-6397
Thomas Deltry, News Editor

New Orleans Magazine
515 Gravier Street
New Orleans, Louisiana 70116 504-246-2700
Carol Flake, Associate Editor

Orleans Guide
8001 Chef Menteur Highway
New Orleans, Louisiana 70126 504-241-6353
Ross Robins, Environmental Reporter

St. Bernard News
620 Tchoupitoulas Street
New Orleans, Louisiana 70130 504-522-6363
Joe Chambers, News Editor

St. Tammany News
728 East Boston Street
Covington, Louisiana 70443 504-892-7980
Emile Navarre, News Editor

Slidell Daily News
1701 Third Street
Slidell, Louisiana 70458 504-643-4918
Steve Busbr, Managing Editor

States-Item
3800 Howard Avenue
New Orleans, Louisiana 70119 504-586-3560
Les Brumfield, Environmental Reporter

Times-Picayune
3800 Howard Avenue
New Orleans, Louisiana 70119 504-586-3680
Cornelia Carrier, Environmental Reporter

Pearl River News Bureau
1537 Ninth Street
Slidell, Louisiana 70458 504-641-1282
Larry Ciko, Bureau Chief

Florida Parishes News Bureau
P.O. Box 213
Covington, Louisiana 70443 504-892-6850
John Fahey, Bureau Chief

WDSU-TV, Channel 6
520 Royal Street
New Orleans, Louisiana 70116 504-588-9378
Bob Jones, Managing Editor, Newsroom

WVUE-TV, Channel 8
1025 South Jefferson Davis Parkway
New Orleans, Louisiana 70125 504-486-6161
Jim Kemp, Managing Editor, Newsroom

WWL-TV, Channel 4
1024 North Rampart Street
New Orleans, Louisiana 70116 504-529-4444
Jim Boyer, Managing Editor, Newsroom
Gary Mitchell, Environmental Reporter

WYES-TV, Channel 12
916 Navarre Avenue
New Orleans, Louisiana 70124 504-486-5511
Bill Hess, Public Affairs Director

D. General Public

Patrick J. Butler
Texaco, Inc.
P.O. Box 60252
New Orleans, Louisiana 70160 504-524-8511

William Collins (Urban Planner)
4121 Baronne Street
New Orleans, Louisiana 70115 504-891-1323

Frederick G. Deiler
Freeport Sulphur Company
P.O. Box 61520
New Orleans, Louisiana 70161 504-568-4317

H. E. Denzler, Jr.
101 Norland Avenue
New Orleans, Louisiana 70114 504-394-5433

Pete van Duyn
41 Riverdale
Covington, Louisiana 70443 504-892-2243
Office: Shell Oil Company
One Shell Square
New Orleans, Louisiana 70139

Ron Fiore
Chevron Oil Company
1111 Tulane Avenue
New Orleans, Louisiana 70112 504-521-6584

Charles Fritzie
Instructor, Department of Physics
Tulane University
New Orleans, Louisiana 70118 504-865-6286

Sally Makielski
Professor, Department of Biology
Loyola University
New Orleans, Louisiana 70118 504-866-5471

Carolyn Morillo
Professor, Department of Philosophy
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x258

George E. Mott
P.O. Box 60252
New Orleans, Louisiana 70160 504-887-1518
home phone: 504-887-1518

Edgar H. Pavia
Pavia Byrnes Engineering Corporation
431 Gravier Street
New Orleans, Louisiana 70130 504-581-9451

Aelita J. Pinter
Associate Professor, Department of Biology
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x307

Don Schueler
Department of English
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x273

John Sevenalar
Professor, Department of Chemistry
Xavier University
New Orleans, Louisiana 70125 504-486-7411

O.J. Shirley
Shell Oil Company
One Shell Square
New Orleans, Louisiana 70160 504-586-6161

R.F. Thomas
Gulf Oil Corporation
P.O. Box 61590
New Orleans, Louisiana 70161 504-524-4282

John Trygg
Roy F. Western, Inc.
Suite 210
3108 Cleary Avenue
Metairie, Louisiana 70002 504-834-8236

E. Community/Consumer Groups

ACORN (A Community Organization for Reform Now)
Zack Pollett, Organizer
816 Howard Avenue, Suite 302
New Orleans, Louisiana 70113 504-524-4474

Civic Beautification Association for Jefferson, Orleans, and St. Bernard Parishes
Mrs. Roland E. Cieutat, Jr.
13 Lark Street
New Orleans, Louisiana 70124

Civic Council of East Jefferson
Hubert Rena, President
P.O. Box 8254
Metairie, Louisiana 70002 504-885-4442

East New Orleans Civic Council
A. Martin
13107 Cherbourg Street
New Orleans, Louisiana 70129

Jefferson Community Action Program
Joseph Maggiore
1817 Airline Highway
Kenner, Louisiana 70062 504-721-5367

Metropolitan Area Committee
Carl Carbin
1308 Richards Building
New Orleans, Louisiana 70112 504-525-2585

Pontchartrain Shores Civic Association
John G. Unzerzagt, President
4620 Shores Drive
Metairie, Louisiana 70002 504-887-6464/504-729-2473

Rotary Club
Ernest Prieto, Secretary
302 Gerard
Mandeville, Louisiana 70448

Rotary Club of New Orleans
James Hanemann
International Trade Mart Building
New Orleans, Louisiana 70130 504-525-6944

Total Community Action
Daniel P. Vincent
1770 Tchoupitoulas Street
New Orleans, Louisiana 70130 504-524-3645

By Parish

Special Interest Groups

Environmental Groups

St. Tammany Parish

Archaeologist
Mrs. John C. Chestnutt
158 Belle Terre Boulevard
Covington, Louisiana 70443 504-892-1003

St. Tammany Environmental Council
Ken and Martha Sollberger
138 Lafayette Street
P.O. Box 644
Mandeville, Louisiana 70448 504-626-8293

St. Tammany Historical Society
Paula Johnson
Abita Springs, Louisiana 70420

Orleans Parish

American Institute of Architects, New Orleans Chapter
Lem McCoy, Executive Director
J. Eean McNaughton, President
4418 Calliope Street
New Orleans, Louisiana 70152 504-821-5596/
504-586-1870

American Lung Association of Louisiana, Inc.
W. Findley Raymond, Executive Director
333 St. Charles Avenue, Suite 1504
New Orleans, Louisiana 70130 504-523-5864

Audubon Society, Orleans Chapter
Frank P. Fischer, President
2720 Octavia Street
New Orleans, Louisiana 70115 504-482-9701/
504-861-1807

Barry Kohler, Conservation Chairman
346 Audubon
New Orleans, Louisiana 70118 504-861-8465/
504-521-6278

Cliff Danby
4843 Gabriel Drive
New Orleans, Louisiana 70127 504-242-4695

Ecology Center of Louisiana, Inc.
Ross Vincent, President
John Hammond, Vice-President
111 South Hennessey Street
New Orleans, Louisiana 70119 — 504-581-2287/ 504-482-8760
Mailing Address: P.O. Box 19344
New Orleans, Louisiana 70179

Louisiana Chapter, American Institute of Planners
Anthony J. Mumphrey, Jr., President
Urban Studies Institute
University of New Orleans
New Orleans, Louisiana 70122 — 504-288-3161 x277

Louisiana Historical Society
William von Trufant, President
Cotton Exchange Building
New Orleans, Louisiana 70130 — 504-588-2474

Louisiana Nature Center, Inc. (educational)
Gary Schadle, President
One Shell Square, Suite 4100
New Orleans, Louisiana 70139 — 504-581-7017

Metropolitan New Orleans Section,
American Institute of Planners
Randolph Clement, Director
c/o New Orleans City Planning Commission
Ninth Floor, City Hall
1300 Perdido Street
New Orleans, Louisiana 70112 — 504-586-4751

Preservation Resource Center of New Orleans
Larry Schmidt
823 Perdido Street, Suite 200
New Orleans, Louisiana 70112 — 504-581-7017

Save Our Wetlands, Inc.
Luke Fontana
4821 Prytania Street
New Orleans, Louisiana 70115 — 504-897-0772

Sierra Club of New Orleans
Mrs. Joan Phillips, President
922 Octavia Street
New Orleans, Louisiana 70115 — 504-482-9701/ 504-482-8760

Jefferson Parish

Friends of Lafitte Park
Frank Ehret, Jr.
5048 Ehret Road
Marrero, Louisiana 70072 504-341-1056

Fund for Animals
Sydney Rosenthal
4141 Veterans Memorial Boulevard
Metairie, Louisiana 70002 504-887-9222

East Baton Rouge Parish

Louisiana Wildlife Federation
Richard F. Stanel, Executive Director
P.O. Box 16089
Louisiana State University
Baton Rouge, Louisiana 70803 504-355-1871

Commercial Fishing/Trapping

St. Tammany Parish

The Bruno Family
Shortcut Road
Mandeville, Louisiana 70448

Freddie Fandal
315 Marigny Avenue
Mandeville, Louisiana 70448 504-626-8217

Orleans Parish

East Bank Fishermen Association
Milton Dudenhefer
Fort Pike (Rigolets), Louisiana 504-662-5795

Louisiana Oyster Dealers and Growers Association
Peter G. Vujnovich
2105 Decatur Street
New Orleans, Louisiana 70112 504-949-5443

Robert Raymond, Trapper and Buyer
6100 Dorothea Street
New Orleans, Louisiana 70126 504-242-2473

Wallace Menhaden Products, Inc.
Jack T. Styron
1221 North Broad Street
New Orleans, Louisiana 70119 504-288-6657

Jefferson Parish

American Shrimp Canners Association
Anthony Cuccia, President
Cutcher Canning Company, Inc.
128 Sala Avenue
Westwego, Louisiana 70094 504-341-3439

Louisiana Shrimp Association
George Snow, President
1405 Jefferson Highway
Jefferson Parish, Louisiana 70123 504-834-2687

St. Bernard Parish

St. Bernard Fishermen Association
Glen ("Duck") Couture
2118 Delille Street
Chalmette, Louisiana 70043 504-277-1847

Sport Fishing, Hunting and Outdoor Recreation

St. Tammany Parish

St. Tammany Sportsmen's League
Henri F. Ferrer, President
Route 5, Box 31½
Covington, Louisiana 70433

Slidell Sportsmen's League
Robert H. Merrell
110 West Pearl Drive, Route 1
Slidell, Louisiana 70458
Permanent Address: P.O. Box 1208
Slidell, Louisiana 70458

Orleans Parish

Byron Almquist, Manager
The Canoe and Trail Shop
624 Moss Street
New Orleans, Louisiana 70115 504-488-8528

Duck Hunters (with Audubon Society)
John Bonck
501 Florida Boulevard
New Orleans, Louisiana 70122 504-488-7364

Ducks Unlimited, New Orleans Area
Ed Gueydon, President
Suite 1313
Pere Marquette Building
New Orleans, Louisiana 70112 504-581-2355

New Orleans Bass Masters (Orleans Parish)
David Schouest, President
3429 Caminada
Marrero, Louisiana 70072 504-347-2871

New Orleans Sportsmen's League
Captain Lloyd A. Moreau, President
5420 Chamberlain Drive
New Orleans, Louisiana 70122 504-282-7187
Permanent Address: P.O. Box 30245
New Orleans, Louisiana 70190

Jefferson Parish

Barataria Bass Masters, Inc.
Leslie L. Cheramie, President
2748 Jimmie Dean Drive
Marrero, Louisiana 70072 504-341-1587

Iron Jaw Bass Masters
Antone J. "Tony" Kovach, President
422 Georgetown Drive
Kenner, Louisiana 70062 504-729-2952/
504-581-9003

Jefferson Rod and Gun Club
Warren Bergeron, President
1104 Beechwood Drive
Harvey, Louisiana 70058
Permanent Address: P.O. Box 23365
Harahan, Louisiana 70183

Kenner Sporting Club
Joe Schmolke, President
1905 34th Street
Kenner, Louisiana 70062

St. Bernard Parish

St. Bernard Sportsmen's League
Edward Hannan, President
13 Jamies Court
Violet, Louisiana 70092
Permanent Address: P.O. Box 1336
Chalmette, Louisiana 70043

Agriculture and Forestry

St. Tammany Parish

St. Tammany Farm Bureau
Larry Catledge, President
Route 2, Box 56
Covington, Louisiana 70043 504-892-6436

Orleans Parish

Wood Unlimited (wood dealers and retailers)
Clark Cromwell, President
P.O. Box 66583
Baton Rouge, Louisiana

A.B. Clark Co.
8000 Oleander
New Orleans, Louisiana 70125 504-482-5733

Jefferson Parish

Jefferson, St. Bernard-Plaquemines Farm Bureau
A.J. Phillips, President
Highway 45
Lafitte, Louisiana 70067 504-689-2185

East Baton Rouge Parish

Louisiana Farm Bureau
James Graunard, President
P.O. Box 15361
Broadview Station
Baton Rouge, Louisiana 70803

Rapides Parish

Louisiana Forestry Association (citizens' group)
William H. Matthews, Executive Director
P.O. Drawer 5067
Alexandria, Louisiana 71301 318-443-2558

Shipping and Ports

Orleans Parish

Board of Commissioners, Port of New Orleans
Edward S. Read, Executive Director
International Trade Mart
New Orleans, Louisiana 70130 504-522-2551

Louisiana Shipbuilding and Repair Association
A.J. Tatman, President
International Trade Mart, Suite 2936
New Orleans, Louisiana 70130 504-586-1155

Shell Dredging and Sand Companies

Shell Dredging

Orleans Parish

Consolidated Materials, Inc.
Don Baxter, President
4200 Howard Avenue
New Orleans, Louisiana 70130 504-488-8741

Louisiana Materials Co., Inc.
Richard R. Murphy, President
P.O. Box 8214
New Orleans, Louisiana 70182 504-947-6681/
504-366-3502

Pontchartrain Materials Corp.
George Douglas, President
1215 Hibernia Bank Building
New Orleans, Louisiana 70112 504-949-7571

Radcliff Materials, Inc.
E.B. Trice, President
P.O. Box 26396
New Orleans, Louisiana 70186 504-282-2561

Shell Producers Association
Burgess Thomasson, President
Radcliff Materials, Inc.
P.O. Box 26396 504-282-2561
New Orleans, Louisiana 70186

Jefferson Parish

Ayers Materials Co., Inc.
P.O. Box 568
Harvey, Louisiana 70058 — 504-787-2255

Sand

St. Tammany Parish

Mississippi Valley Silica Company
Frank Bogran, President
324 East Boston
Covington, Louisiana 70443 — 504-892-4211/ 504-524-8849

Orleans Parish

George Kellett and Sons, Inc.
Percy Kellett, President
1330 Press Street
New Orleans, Louisiana 70117 — 504-945-1118

Jefferson Parish

Louisiana Industries
William H. Dobson, Manager
5825 River Road
Harahan, Louisiana 70183 — 504-733-7730

St. Bernard Parish

Chalmette Sand and Material
L.T. Murphy
1504 East St. Bernard Highway
Chalmette, Louisiana 70043 — 504-271-5985/ 504-271-4979

Home Builders, Land Developers, and Realtors

St. Tammany Parish

JPT Land Corporation
Jules L. Rosenblum, President
Beau Rivage Subdivision
Slidell, Louisiana 70458 — 504-626-7819

Richwood Homes
Joe Hodge
Tanglewood
Slidell, Louisiana 70458

Orleans Parish

Diamonhead Corporation
William Bru, President
4500 General DeGaulle Drive
New Orleans, Louisiana 70130 504-393-1500

Homebuilders Association of Greater New Orleans, Inc.
Lewis Stall, President
1639 Gentilly Boulevard
New Orleans, Louisiana 70122 504-943-3325

Land and Royalty Owners of Louisiana
Urbain Burvant, Executive Director
Whitney Bank Building
New Orleans, Louisiana 70130 504-523-3701

New Orleans East, Inc.
Harold Cook
13232 Chef Menteur Highway
P.O. Box 29188
New Orleans, Louisiana 70189 504-254-1400

Real Estate Board of New Orleans
Gertrude Gardner
826 Perdido Street
New Orleans, Louisiana 70130 504-943-3325

Zollinger Company, Inc.
Lewis Zollinger
1458 North Broad Street
New Orleans, Louisiana 70122 504-949-4401

Jefferson Parish

Chateau Estates
E.C. Dorbin, President
3600 Chateau Boulevard
Kenner, Louisiana 70062 504-722-1351

Jefferson Board of Realtors
Chuck Staub
4732 Utica Street
Metairie, Louisiana 70002 504-885-3200

Rathbone Land Company
Henry Fair
Fourth Street
Harvey, Louisiana 70159 504-368-6335

Commercial and Industrial Interests

St. Tammany Parish

National Alliance of Businessmen
Gary W. December, Chairman
210 Legendre Drive
Slidell, Louisiana 70458 504-641-2035

Orleans Parish

Chamber of Commerce of Greater New Orleans
William G. McCullum, Chairman
Christopher Laborde, West Bank
Elias McColloster, Environmental Issues (x245)
301 Camp Street
New Orleans, Louisiana 70130 504-524-1131

Economic Development Council of the New Orleans Area
Tom Purdy, Director
Clement A. Cole, Manager, Industrial Development Department
Andrew F. Flores, Manager, Commercial Development Department
301 Camp Street
New Orleans, Louisiana 70130 504-524-1131

New Orleans Board of Trade
Gilbert H. Vorhoff, President
316 Board of Trade Place
New Orleans, Louisiana 70130 504-525-3271

Young Men's Business Club of Greater New Orleans
John E. O'Shea, President
Braniff Place, Suite 209
New Orleans, Louisiana 70140 504-525-0747

Oil and Gas Producers

Orleans Parish

Louisiana Association of Independent Producers
and Royalty Owners
Gilbert J. Sevier
Pere Marquette Building
New Orleans, Louisiana 70112 504-523-5764

Offshore Operations Committee
C.E. Galay
1111 Tulane Avenue
New Orleans, Louisiana 70112 504-521-6584
Mailing Address: P.O. Box 50751
New Orleans, Louisiana 70150

Petroleum Club of New Orleans
925 Common Street
New Orleans, Louisiana 70112 504-524-3203

Clarence W. Coffey, Sr., President
Chevron Oil
1111 Tulane Avenue
New Orleans, Louisiana 70112 504-521-6311

East Baton Rouge Parish

Mid-Continent Oil and Gas
111 Thompson Building
Tulsa, Oklahoma 74103 918-582-5166

Vernon Dowdy, Louisiana Representative
Fidelity Bank Building, Suite 519
Baton Rouge, Louisiana 70801 504-387-3205

General Interest Groups

Minorities

Orleans Parish

Black Lawyers Association: Louis A. Martinette Society
Trevor G. Bryan, Secretary
Jefferson and Bryan
One Shell Square, Suite 3828
New Orleans, Louisiana 70139 504-561-8933

Irish Channel Action Foundation
Aubry Houze, Bilingual Program Chairman
1020 Hernandez Street
New Orleans, Louisiana 70130 504-523-5442

Latin American Apostolate (has list of Latin American clubs)
Father Robert Keenan, Director
821 General Pershing
New Orleans, Louisiana 70113 504-895-0395

League of United Latin American Citizens (LULAC)
Dr. Ernesto Rodriguez, Chairman
c/o Modern Languages Institute
1208 St. Charles Avenue
New Orleans, Louisiana 70130 504-529-4121

Mayor's Latin Advisory Committee (LAC)
Richard Arellano, President
c/o International Marketing Institute
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x279

NAACP, New Orleans Branch
Dyan French Cole, President
1821 Orleans Avenue
New Orleans, Louisiana 70116 504-821-4220

Perkins and James Architects
Robert Perkins
1661 North Claiborne Avenue
New Orleans, Louisiana 70117 504-944-0351

Urban League of Greater New Orleans
Clarence Barney, Executive Director
Millie M. Charles, Chairwoman, Board of Directors
(504-282-4401)
816 Howard Avenue
New Orleans, Louisiana 70113 504-523-6733

Jefferson Parish

Comite Latino
Gary Aspiazu, President
2133 Kansas Avenue
Kenner, Louisiana 70062 504-722-4713

Good Government Advocates

St. Tammany Parish

League of Women Voters, St. Tammany Parish Chapter
Judy Zirkle, President
Covington, Louisiana 70443

Orleans Parish

Citizens Voter Education Association
George Ethel Warren
1836 Reynes Street
New Orleans, Louisiana 70127 504-944-8507 (home)

Common Cause
Dr. Sherwood Githens
3927 Camp Street
New Orleans, Louisiana 70118 504-899-5137/
504-288-3161 x307

Governor's Citizen Advisory Committee
Michael Maloney, Chairman
Whitney Bank Building, Suite 1100
228 St. Charles Avenue
New Orleans, Louisiana 70130 504-581-3333

Institute of Human Relations
David Boileau, S.J.
Loyola University
6363 St. Charles Avenue
New Orleans, Louisiana 70118 504-866-5411

League of Women Voters
Peggy Barnett, President: Orleans Parish Chapter
Charlotte Fremaux, President: Jefferson Parish Chapter
Marietta Herr (59 Oriole Street 504-283-2929)
1636 Toledano Street
New Orleans, Louisiana 70115 504-897-2062

Louisiana Center for the Public Interest
David Marcello, Director
921 Canal Street, Suite 1222
New Orleans, Louisiana 70112 504-524-1231/
504-524-8182

Louisiana League of Good Government
Clara Antoine
1434 North Johnson Street
New Orleans, Louisiana 70116 504-949-8815

Florence Frazier
5812 Lafaye Street
New Orleans, Louisiana 70122 504-282-2510

Metropolitan Goals Foundation Program
Francis Keevers
Richard Dennery
1029 Maritime Building
203 Carondelet Street
New Orleans, Louisiana 70130 504-581-6355/
504-521-3947

Media

St. Tammany Parish

St. Tammany News
Emile Navarre, News Editor
728 East Boston Street
Covington, Louisiana 70443 504-892-7980

Slidell Daily News
Steve Busbr, Managing Editor
1701 Third Street
Slidell, Louisiana 70458 504-643-4918

Times-Picayune
Pearl River News Bureau
Larry Ciko, Bureau Chief
1537 Ninth Street
Slidell, Louisiana 70458 504-641-1282

Florida Parishes News Bureau
John Fahey, Bureau Chief
P.O. Box 213
Covington, Louisiana 70443 504-892-6850

Orleans Parish

Figaro
Jerry Lipsick, Environmental Reporter
1070 St. Charles Avenue
New Orleans, Louisiana 70115 504-524-3628

New Orleans Magazine
Carol Flake, Associate Editor
515 Gravier Street
New Orleans, Louisiana 70116 504-246-2700

Orleans Guide
Ross Robins, Environmental Reporter
8001 Chef Menteur Highway
New Orleans, Louisiana 70126 504-241-6353

St. Bernard News
Joe Chambers, New Editor
620 Tchoupitoulas Street
New Orleans, Louisiana 70130 504-522-6363

States-Item
Les Brumfield, Environmental Reporter
3800 Howard Avenue
New Orleans, Louisiana 70119 504-586-3560

Times-Picayune
Cornelia Carrier, Environmental Reporter
3800 Howard Avenue
New Orleans, Louisiana 70119 504-586-3680

WDSU-TV, Channel 6
Bob Jones, Managing Editor, Newsroom
520 Royal Street
New Orleans, Louisiana 70116 504-588-9378

WVUE-TV, Channel 8
Jim Kemp, Managing Editor, Newsroom
1025 South Jefferson Davis Parkway
New Orleans, Louisiana 70125 504-486-6161

WWL-TV, Channel 4
Jim Boyer, Managing Editor, Newsroom
Gary Mitchell, Environmental Reporter
1024 North Rampart Street
New Orleans, Louisiana 70116 504-529-4444

WYES-TV, Channel 12
Bill Hess, Public Affairs Director
916 Navarre Avenue
New Orleans, Louisiana 70124 504-486-5511

Jefferson Parish

Jefferson Parish Times
Thomas Deltry, News Editor
P.O. Box 204
3033 North Causeway Boulevard
Metairie, Louisiana 70002 504-837-6397

General Public

Orleans Parish

Patrick J. Butler
Texaco, Inc.
P.O. Box 60252
New Orleans, Louisiana 70160 504-524-8511

William Collins (Urban Planner)
4121 Baronne Street
New Orleans, Louisiana 70115 504-891-1323

Frederick G. Deiler
Freeport Sulphur Company
P.O. Box 61520
New Orleans, Louisiana 70161 504-568-4317

H. E. Denzler, Jr.
101 Norland Avenue
New Orleans, Louisiana 70114 504-394-5433

Pete van Duyn
41 Riverdale
Covington, Louisiana 70443 504-892-2243
Office: Shell Oil Company
One Shell Square
New Orleans, Louisiana 70139

Ron Fiore
Chevron Oil Company
1111 Tulane Avenue
New Orleans, Louisiana 70112 504-521-6584

Charles Fritzie
Instructor, Department of Physics
Tulane University
New Orleans, Louisiana 70118 504-865-6286

Sally Makielski
Professor, Department of Biology
Loyola University
New Orleans, Louisiana 70118 504-866-5471

Carolyn Morillo
Professor, Department of Philosophy
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x258

George E. Mott
P.O. Box 60252
New Orleans, Louisiana 70160 504-887-1518

Edgar H. Pavia
Pavia Byrnes Engineering Corporation
431 Gravier Street
New Orleans, Louisiana 70130 504-581-9451

Aelita J. Pinter
Associate Professor, Department of Biology
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x307

Don Schueler
Department of English
University of New Orleans
New Orleans, Louisiana 70122 504-288-3161 x273

John Sevenalar
Professor, Department of Chemistry
Xavier University
New Orleans, Louisiana 70125 504-486-7411

O. J. Shirley
Shell Oil Company
One Shell Square
New Orleans, Louisiana 70160 504-586-6161

R. F. Thomas
Gulf Oil Corporation
P.O. Box 61590
New Orleans, Louisiana 70161 504-524-4282

Jefferson Parish

John Trygg
Roy F. Western, Inc.
3108 Cleary Avenue, Suite 210
Metairie, Louisiana 70002 504-834-8236

Community/Consumer Groups

St. Tammany Parish

Rotary Club
Ernest Prieto, Secretary
302 Gerard
Mandeville, Louisiana 70448

Orleans Parish

ACORN (A Community Organization for Reform Now)
Zack Pollett, Organizer
816 Howard Avenue, Suite 302
New Orleans, Louisiana 70113 504-524-4474

Civic Beautification Association for Jefferson, Orleans, and St. Bernard Parishes
Mrs. Roland E. Cieutat, Jr.
13 Lark Street
New Orleans, Louisiana 70124

East New Orleans Civic Council
A. Martin
13107 Cherbourg Street
New Orleans, Louisiana 70129

Metropolitan Area Committee
Carl Carbin
1308 Richards Building
New Orleans, Louisiana 70112 504-525-2585

Rotary Club of New Orleans
James Hanemann
International Trade Mart Building
New Orleans, Louisiana 70130 504-525-6944

Total Community Action
Daniel P. Vincent
1770 Tchoupitoulas Street
New Orleans, Louisiana 70130 504-524-3645

Jefferson Parish

Civic Council of East Jefferson
Hubert Rena, President
P.O. Box 8254
Metairie, Louisiana 70002 504-885-4442

Jefferson Community Action Program
Joseph Maggiore
1817 Airline Highway
Kenner, Louisiana 70062 504-721-5367

Pontchartrain Shores Civic Association
John G. Unzerzagt, President
4620 Shores Drive
Metairie, Louisiana 70002 504-887-6464/
504-729-2473

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CHAPTER 2

CURRENT COASTAL ACTIVITIES, USES AND MANAGEMENT EFFORTS

INTRODUCTION

The purpose of this chapter is to describe some of the current uses and activities in the coastal zone and the efforts being undertaken by the parishes to manage the coastal zone. The first part of the chapter describes the following coastal activities and uses and their effects on the ecosystem:

1. land use, including residential, commercial and industrial uses;
2. recreation, including sports, historical and cultural areas;
3. commercial fisheries and trapping, including the economic value of catches;
4. flood and storm control, including the construction of present and proposed major levee systems;
5. major navigation canals, including those used for commercial and recreational activities; and
6. water quality and wastewater treatment, including those problems attendant upon municipal and industrial sewerage discharges.

The first part of the chapter also discusses user activities such as dredge and fill operations, spoil disposal and related soil erosion. The environmental impact of these activities on the air, water, fish and wildlife, historical and archeological preservation, and "critical" areas are noted.

The second part of the chapter presents an overview of the parishes' current efforts to manage their coastal zones. Local planners in each parish are aware of the need to balance growth in the area with protection of its environmentally sensitive zones. The parishes are at different stages in developing coastal zone management plans. Each parish intends to develop its own plan with the assistance of the State Planning Office.

Following the chapter is Appendix 2.1, which is an annotated bibliography of the parishes' coastal management and planning documents.

CURRENT COASTAL USES AND ACTIVITIES

Land Use

None of the four parishes in the New Orleans SMSA has a coastal zone management plan that has been adopted as law by the governing officials. In these parishes, land use is regulated by zoning ordinances and building codes. Although the parishes recognize the need to protect existing environmentally sensitive areas such as wetlands, reclamation of these areas is not ruled out entirely. The Interim Land Use Plan (N-Y Associates, 1973) adpoted by the Regional Planning Commission in 1973 provides that future use of wetlands be for passive recreation areas, general open space or wildlife preserves. The plan does not rule out reclamation of such areas; it only suggests that more studies be done before reclamation occurs (Mumphrey *et al.*, 1975: 32).

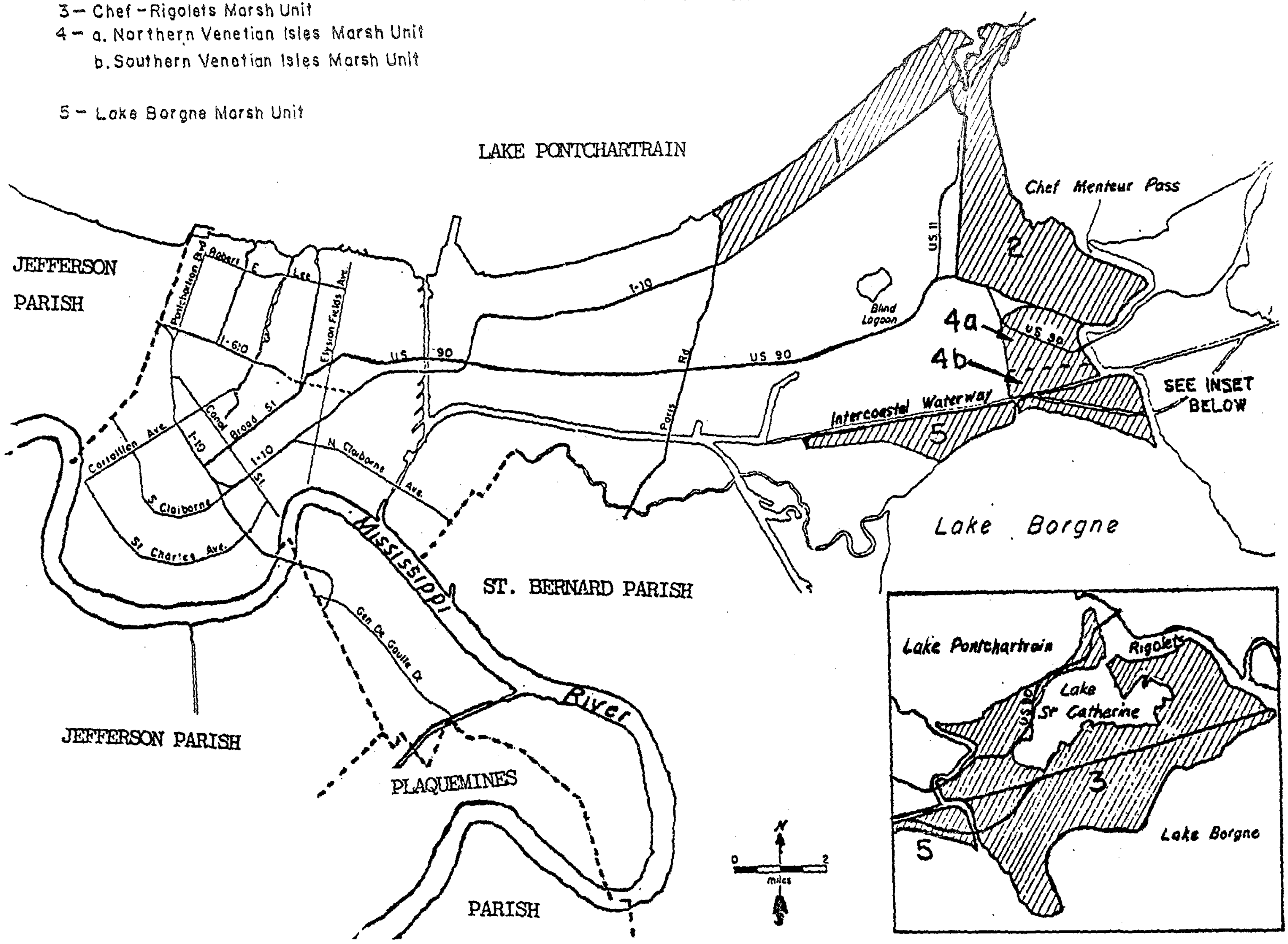
New Orleans

The Comprehensive Zoning Ordinance for the City of New Orleans (City Planning Commission of New Orleans, 1970) permits growth in the wetland areas that include the Lakefront Marsh Unit, the Chef Menteur Marsh Unit, Chef-Rigolets Marsh Unit, Lake Borgne Marsh Unit, and the Venetian Isles Marsh Unit (see Figure 2.1). Zoning in the Lakefront Marsh Unit allows for low-density residential and neighborhood business districts. In the Chef Menteur Marsh Unit, low-density residential to light industrial and nonurban uses are allowed by the zoning ordinance. Chef-Rigolets and the Lake Borgne Marsh Units are zoned nonurban. Venetian Isles Marsh Unit is zoned for light and heavy industrial, residential and nonurban uses. Nonurban uses include single- and two-family residential, schools, boat repair and ship yards, trailer parks, child care centers, as well as farms, recreational areas and conservation areas, provided that the uses remain within the performance standards for smoke, dust, toxic or noxious waste materials (Mumphrey et al., 1975: 34).

The Coastal Zone Management Plan (City Planning Commission of New Orleans, 1975: 30) designates as critical areas "those viable marsh and forest areas which should be preserved because of their value as recreational and economic resources...development in these areas should be prohibited." Critical areas have been identified as Chef Menteur Unit, Southern Venetian Isles Marsh Unit, and Lake Borgne Marsh Unit and adjacent area (between it and the

FIGURE 2.1

New Orleans Wetlands



Source: Mumphrey et al. 1975: 33

Mississippi River Gulf Outlet), as well as the Lower Coast of Algiers. Since the Coastal Zone Management (CZM) plan has not been adopted as law, its recommendations carry no legal sanctions.

On July 29, 1976, the New Orleans City Council approved a land use plan for the Orlandia development in eastern New Orleans that envisions 50,000 new dwelling units (Times-Picayune, 1976: 12). Orlandia poses a threat to three of the wetlands units--Lakefront Marsh Unit, Chef Menteur Marsh Unit, and Venetian Isles Marsh Unit (Mumphrey et al., 1975: 35). The developers of Orlandia intend to use land in the Lakefront Marsh Unit, which has been leveed and partially drained, for mainly single- and multi-family residences, with some business and commercial areas. The Chef Menteur Marsh Unit is intended for nonurban uses. Land in the Venetian Isles Marsh Unit is planned for nonurban uses and single-family residential areas. A variety of land uses, including residential, light and heavy industrial, and commercial and business, will be found within the central core of Orlandia (New Orleans East, Inc., n.d.). This land is partially drained-off fresh water marsh, and as such it makes no contribution to the viable estuarine system.

The City Planning Commission has considered the proposal that individuals be allowed to build homes in the wetlands provided they do not develop more than five percent of their land. Roads would not be built in these areas; access to homes would be by boat or plane. However, the City

Planning Commission believes there is enough developable land, including Orlandia, available to accommodate the city's growth for the next several years (Clement, R., 1976).

The Building Code for the City of New Orleans (City Planning Commission of New Orleans, 1975: 54-57) requires that all residential and nonresidential structures and substantial improvements to these structures must be above the base flood level of the 100-year storm, or the structures must be flood proofed to the prescribed base flood elevation.

Jefferson

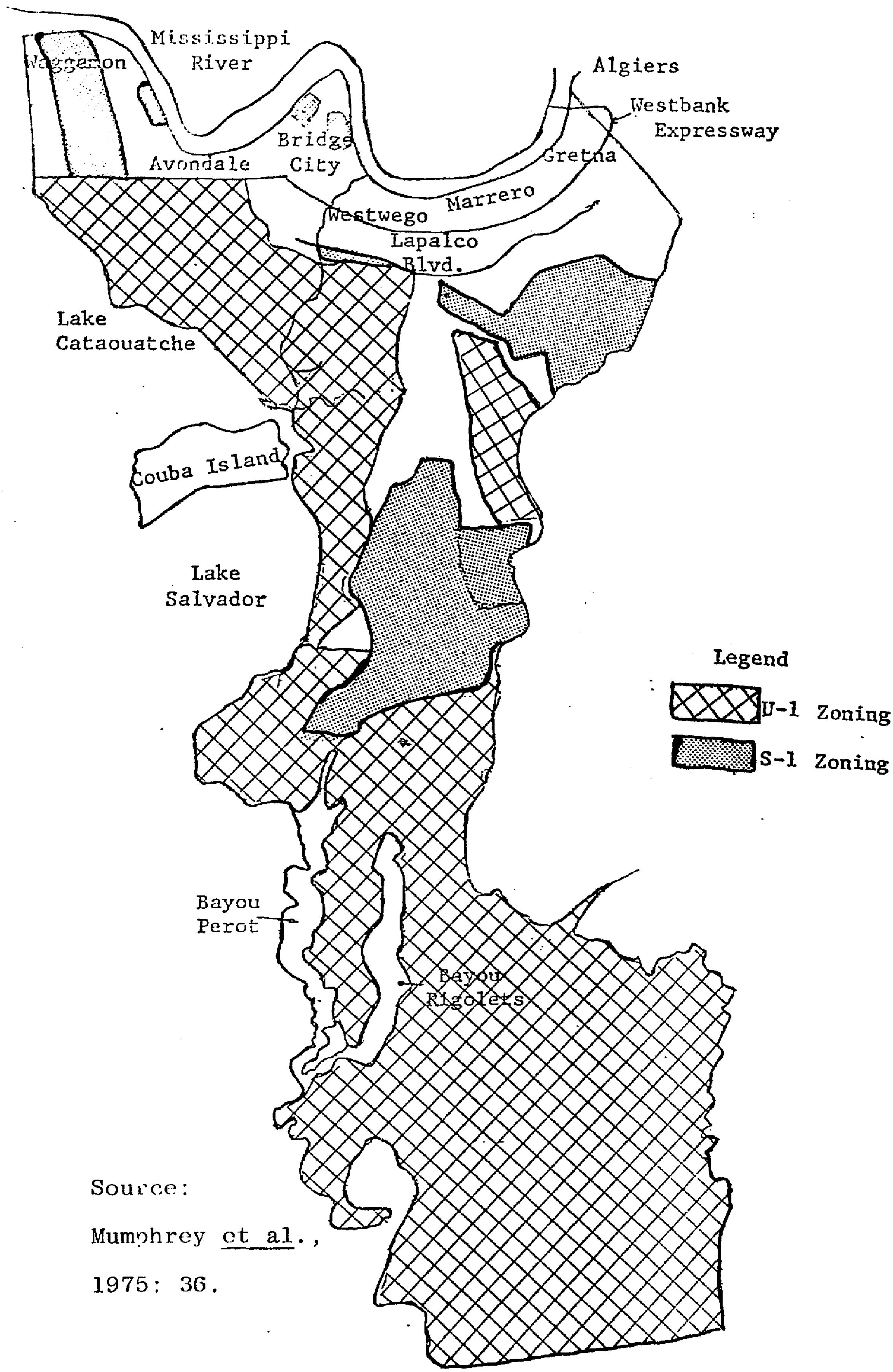
A Comprehensive Zoning Ordinance (Jefferson Parish Council, 1974) was adopted by the Jefferson Parish Council in 1974 to guide development in the parish. Most existing wetlands are in the southern portion of the parish on the West Bank. Land on the West Bank is zoned in two categories, S-1 and U-1 (see Figure 2.2).

S-1 land is zoned as a low-density residential district. Permitted uses include single- and two-family dwellings, as well as farming and airports. U-1 land is zoned as unrestricted. Manufacturing plants in this district may be involved in products which give off offensive emissions of odor, smoke, gas, and excessive glare, light, or noise (Mumphrey et al., 1975: 35-37).

From the zoned areas, it would appear that Jefferson Parish intends to develop its wetlands. Hugh Ford, the Parish's Planning Director, expects that the West Bank will

FIGURE 2.2

Jefferson Parish, Zoning Districts



Source:

Mumphrey et al.,

1975: 36.

continue to develop, but that future development will be determined by the location of present levees. The parish has plans to strengthen existing levees, especially in the Lafitte area, but he said there are no plans for wholesale reclamation (Ford, 1976).

St. Bernard

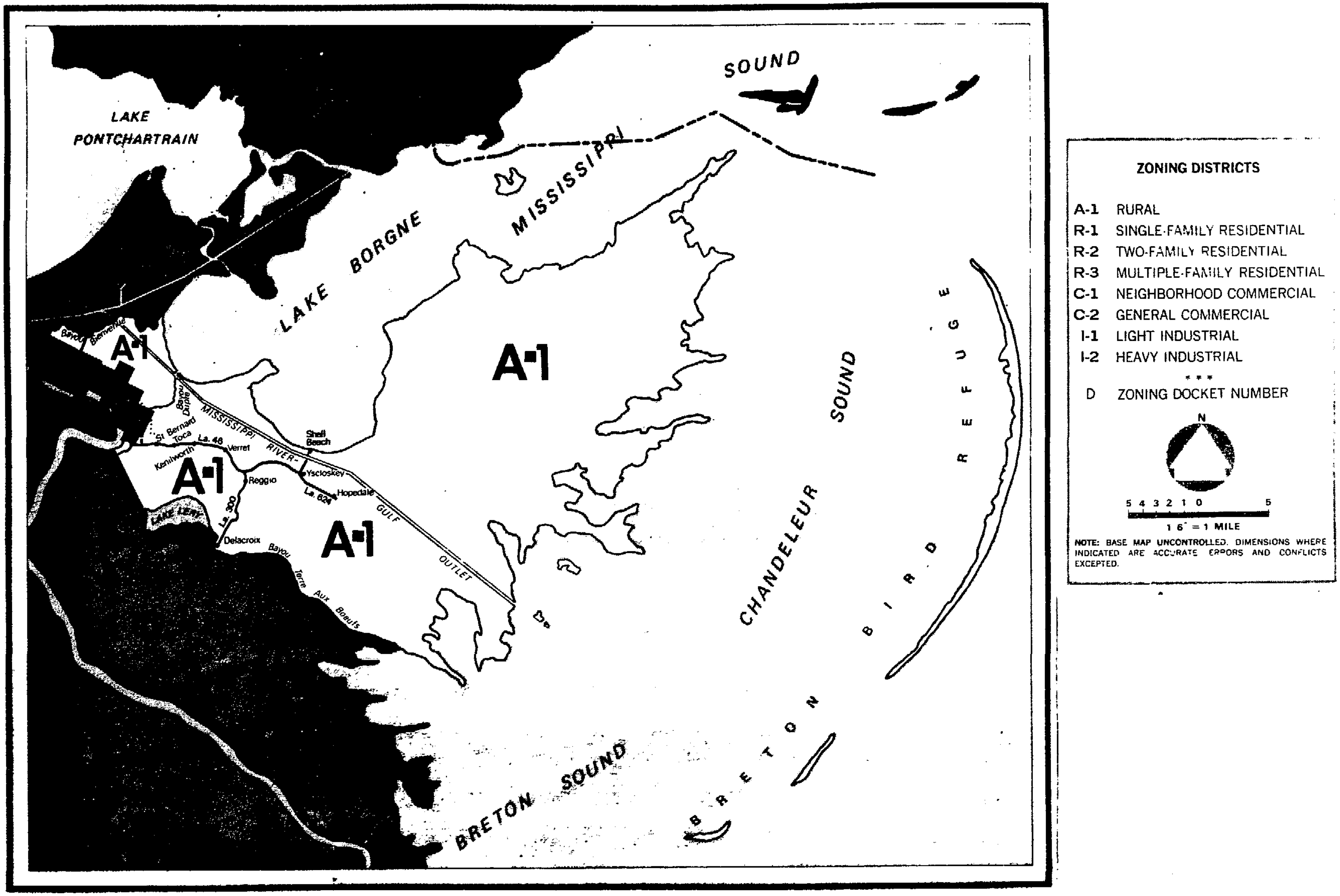
For its land use plans, St. Bernard relies on its Comprehensive Zoning Ordinance adopted by the St. Bernard Police Jury in 1971 (St. Bernard Planning Commission, 1971). Most of St. Bernard may be described as open marsh. The wetlands areas are zoned A-1 rural (see Figure 2.3). In areas zoned A-1 rural, all uses--residential, commercial and industrial--are permitted. The Parish Board of Adjustment may permit utilities, airports and recreational development in wetlands (Mumphrey et al., 1975: 37).

The parish is in the process of creating a CZM plan. As one of the components of that plan, the Planning Commission would like to zone the wetlands so that they can be preserved and protected. The Commission would also like to limit all further development to land already leveed, because they recognize the expense involved in reclaiming and draining un-leveed land (Chetta, 1976).

St. Tammany

In January of 1972, the St. Tammany Parish Police Jury adopted the Parish Land Use Ordinance (St. Tammany Parish Police

FIGURE 2.3
St. Bernard Parish, A-1 Zoning District



Source: St. Bernard Parish Planning Commission, 1971: Map Section.

Jury, 1972) which established the comprehensive land use regulations for the parish. The parish has plans to develop a comprehensive zoning code in 1977. One of the six types of land use districts is the "inundation district" (or "F" district), which includes those areas subject to severe flooding at frequent intervals. In this district, it is required that main floors be elevated to a height of not less than one foot above the highest flood level as recorded since 1921. Along the coast of Lake Pontchartrain, this will mean floor levels of not less than eight feet. Other land use districts with a suffix "f", meaning the possibility of inundation exists, will be subject to the same minimum floor level requirements.

Population in St. Tammany grew by 64.5 percent between 1960 and 1970, a result of NASA activity at the Michoud Assembly Facility and urban flight, which continues. The Chief Planner of the Parish believes that the parish should be further developed, but within limits (Sinden, 1976). He and the parish police jury have not decided what those limits should be.

Projections show that population will continue to grow faster in the coastal zone than elsewhere in the state (see Table 5.5, below), increasing the demands for residential, commercial, and industrial land uses. How to balance the need for further economic development with the preservation of environmentally sensitive areas is a critical decision that the parishes are attempting to resolve.

The four parishes are planning for increased industrial and commercial development. St. Tammany has proposed that a 30-acre industrial park be built in Slidell, near I-10 by the Slidell Airport. Consideration is also being given to a tourist development area in Mandeville. The parish presently is conducting a study of the waterfront property in Mandeville to determine its future use (Sinden, 1976).

In St. Bernard the local officials are attempting to gain jurisdiction over the Mississippi River frontage in their parish, which is now claimed by the New Orleans Dock Board. The parish would also like to control the Mississippi River Gulf Outlet frontage, although they would not expect to use this property before 1995 because of lack of access to this area. The river frontage would be used for wharves and warehouses (Chetta, 1976).

Orleans Parish officials are concentrating on the 28,000 acre development of Orlandia, which includes acreage for commercial and industrial sites. Mayor Moon Landrieu of New Orleans has said that the future of the city is in Eastern New Orleans and Orlandia is the first step in a process of controlled and orderly growth (Times-Picayune, 1976).

Jefferson Parish officials would still like to see the construction of a segment of I-410 in their parish, because it would lead to greater economic development of the West Bank (Terranova, 1976). The construction was blocked as the result of a suit filed by environmental groups in the area which charged that the proposed highway would have cut through viable wetlands.

Regional officials seek the development of the proposed Louisiana Offshore Oil Port (LOOP). Present plans for LOOP call for a 48-inch pipeline to come ashore from the Gulf just east of Bayou Lafourche. The pipeline will skirt the Leeville oil field and run along Highway 1 and Bayou Lafourche. Imported crude oil is to be stored underground in leached out cavities in the Clovelly salt dome near Galliano (Mumphrey et al., 1976: 361-368).

Recreation

The coastal zone in Louisiana offers its residents many opportunities for recreational activities, from fishing and boating to hunting and camping. Projections of water activities such as boating and water skiing, and of other activities such as hunting, fishing, crabbing and crawfishing in terms of user days for 1980 and 1985 show a marked increased in use (see Table 2.1). There is a need, then to ensure environmental quality of the recreational resources of the coastal zone, as well as to develop additional recreational facilities.

There are a variety of recreational areas in the four parishes of the New Orleans SMSA, including federal, state, and local lands and facilities (see Tables 2.2-2.5). Wetland and water-related activities have been emphasized in the recreational sites considered (Burk and Associates, 1975).

TABLE 2.1

USER-DAYS FOR VARIOUS RECREATIONAL ACTIVITIES

LOUISIANA COASTAL PARISHES, 1970-1985 (PROJECTED)

Activity	User-Days 1970	1975	1980	1985
Fishing	7,525,570	8,701,520	10,242,707	12,242,412
Motorboating	4,135,456	4,781,665	5,301,292	5,727,459
Hunting	2,349,719	2,768,920	3,260,911	3,849,668
Crabbing	1,971,255	2,279,631	2,684,685	3,147,275
Waterskiing	1,442,601	1,688,022	1,964,404	2,346,787
Crawfishing	1,178,123	1,362,217	1,604,262	1,925,543
Birdwatching	1,610,904	1,862,625	2,193,584	2,620,579
TOTALS	20,258,628	23,424,600	27,311,845	32,905,723

Source: Mumphrey et al., 1975: 114.

TABLE 2.2

ORLEANS PARISH
RECREATIONAL SITES

State Parks and Monuments

Fort Pike State Monument, 125 acres, Hwy. 90 at Rigolets Pass

Miscellaneous Recreational Facilities and Areas

Lake Pontchartrain, fishing, swimming, boating
New Orleans (136 areas)
Public Boat launching ramps and facilities at South Shore, Chef Menteur Pass, Rigolets, Seabrook Bridge, West End
City Park
Audubon Park
Joe Brown Park
Brechtel Park
Pontchartrain Park
Pontchartrain Beach
Pontchartrain Lakeshore and seawall
Bayou St. John
Orleans Marina
Municipal Yacht Harbor
West End Park
Bennie Larmann's Boat Launch, at Irish Bayou
Strenge's Boat Launch, at Irish Bayou
Freddie Yarbrough's Boat Launch, at Bayou Sauvage and Lake Catherine
Lee's Place (boat launch), on Lake Catherine
Buddy's Marina, on Lake Catherine
Lake Catherine Marina, on Lake Catherine
Master Place Boat Launch - Hwy. 90 near Rigoletts
S & S Launching, Bayou Bienvenue and Hwy. 47

Source: Burk and Associates, 1975: 36.

TABLE 2.3

JEFFERSON PARISH
RECREATIONAL SITES

State Parks and Monuments

Grand Isle State Park, 100 acres on east side of Grand Isle

Jean Lafitte State Park (proposed) north of Crown Point west of Highway 45

Miscellaneous Recreational Facilities and Areas

Bayou Segnette Camps
Bayou Segnette boat launch - Louisiana Avenue
Boat Launches - Bonnabel Canal and end of Williams Blvd.

Seaway Marina, Lafitte
Rosethorn Park and Boat launch, picnic area
Bridgeside Marina, Grand Isle at Caminada Pass
Sport Fishing Charter Fleet, east end of Grand Isle
Lafreniere Park on East Bank of Jefferson Parish
Linear Park (proposed) along Lake Pontchartrain Shoreline
Sand beach along Grand Isle and Elmer's Island, surf fishing, swimming
Lake Pontchartrain, fishing, skiing, swimming, sailing

Source: Burk and Associates, 1975: 32.

TABLE 2.4

ST. BERNARD PARISH
RECREATIONAL SITES

State Parks and Monuments

St. Bernard State Park, located near Caernarvon, south of English Turn

National Parks

Chalmette National Historical Park, 142 acres, near Chalmette

State Wildlife Management Areas

Biloxi Wildlife Management Area, 39,580 acres, on the eastern side of Lake Borgne

Federal Wildlife Refuges

Breton National Wildlife Refuge, 7,500 acres, in the Chandeleur Islands

Miscellaneous Recreational Facilities and Areas

Public Beach along Chandeleur Islands, saltwater fishing

Marinas and boat launching facilities at Shell Beach, Hopedale, Delacroix Island, Bayou Bienvenue, Violet
St. Bernard Recreation Department, 9 areas
Pakenham Oaks and de la Ronde Park, near Chalmette National Historical Park

State Designated Wilderness Areas

St. Bernard Delta Wilderness Area

Source: Burk and Associates, 1975: 37.

TABLE 2.5

ST. TAMMANY PARISH
RECREATIONAL SITES

State Parks and Monuments

Bogue Falaya Wayside Park, 13 acres, east of Covington

Fairview Riverside State Park, 99 acres, near Madisonville

Fontainbleau State Park, 2,755 acres, near Mandeville

State Wildlife Management Areas

Pearl River Wildlife Management Area, 26,700 acres near Slidell

State Wildlife Refuges

St. Tammany Wildlife Refuge, along Lake Pontchartrain south of Lacombe

Natural and Scenic Rivers

Bogue Chitto River, from Mississippi line to entrance into Pearl River Navigation Canal
Tchefuncte River, from origin in Tangipahoa Parish to its juncture with the Bogue Falaya River
West Pearl River, from Mississippi State line to Lake Borgne

Potential Registered Natural Landmarks

Honey Island Swamp, scenic relatively unaltered cypress-tupelo gum swamp

Miscellaneous Recreational Facilities and Areas

Bayou Lacombe, freshwater fishing and boating, near Lacombe
Geoghagan Marina, at the Rigolets and Hwy. 90

TABLE 2.5 CONTINUED

St. Tammany Parish (Cont'd.)

Miscellaneous Recreational Facilities and Areas

North Shore - Saray Beach Area, marina, boating, salt and freshwater fishing
Covington Tent Town Camping area, 7 mi. north of Covington on Hwy. 25
Money Hill Plantation Woodland Park, camping, picnicing and freshwater fishing, La. 435 between Abita Springs and Talisheek

Five Lakes Camping Area, 3 miles northwest of Bush via Hwy. 21 and 40
Lake Ramsey, fishing, skiing and boating, 3 mi. north of Covington off La. 25
Mandeville Municipal Harbor, marina facilities south of Mandeville
Pearl River locks and associated canals, freshwater fishing, camping, picnicing, above Hickory
Boat launches at Davis Landing, Campbell's Landing and Indian Village near the Pearl River Wildlife Management Area

Chahta Campground, swimming, hiking, camping and fishing, Hwy. 190 near Mandeville
Red Arrow Campground, camping, Hwy. 190, 2 miles south of Covington

Source: Burk and Associates, 1975: 34-35.

1. State parks and monuments constitute 3450 acres in the four parishes, with St. Tammany having the largest park, Fontainbleau State Park, near Mandeville.
   St. Bernard has the only national park, Chalmette National Historical Park.
2. There are 66,280 acres of wildlife management areas, found in St. Bernard and St. Tammany.
3. There are 1600 acres of state wildlife refuge areas, found in St. Tammany.
4. St. Bernard has 7500 acres of federal wildlife refuge areas.
5. Natural and scenic rivers are found in St. Tammany.
6. In each parish, there is at least one local park and recreational area, public or private beach, and several boat launches and marinas. Jefferson and St. Tammany Parishes both have public hunting, fishing and camping areas. St. Bernard has the St. Bernard Delta Wilderness Area, a state-owned area.

Recreational activities, if properly planned and managed, need not have any deleterious effects on coastal resources. There is, however, the potential for negative ecological effects. These include litter, increased erosion from excessive use, the disposal of sewage generated by recreationists, and loss of wilderness characteristics and ecosystem changes because of commercial recreational development (Louisiana Advisory Commission, 1973: 268). One must also be careful that recreational activities do not compete with and adversely affect other uses in the coastal zone, such as commercial fisheries, agricultural and mineral production.

Also, as the Louisiana Advisory Commission (1973: 252-263) noted, there are certain problems which impede the full use and enjoyment of recreational resources in the coastal zone. These problems include lack of recreational facilities and lands, pollution of Louisiana's water, erosion of Louisiana's shoreline, and lack of public access to many natural resources.

In this section has also been included the many historical, cultural and tourist features that can be found in the four parishes in the New Orleans Region (Burk and Associates, 1975). "Historical sites and tourist attractions" include plantation homes, forts, cemeteries, churches, museums, monuments, old administrative buildings, and battlegrounds (see Tables 2.6-2.9).

Presently 13 state agencies have a responsibility for providing facilities and/or funds for recreational development in Louisiana. There is a need for greater coordination among these agencies, as well as greater coordination between state and federal agencies and between state agencies and the private sector (Louisiana State Parks and Recreation Commission, 1974: 7.2).

Commercial Fisheries and Trapping

The fishing and trapping industries add a substantial amount of money to the annual economy of Louisiana. In 1975 the total dockside figure for all Louisiana fishing was $88 million. The dockside figure includes only the value of the

TABLE 2.6

ST. TAMMANY PARISH
HISTORIC, CULTURAL AND TOURIST FEATURES

Historical Sites and Tourist Attractions

Site of Old Brick Foundry, located on the Leche Estate outside Covington

Honey Island Swamp located between the Pearl River and the town of Pearl River on U.S. 11

Indian Village, located about 4 miles off Salt Bayou Road (La. Hwy. 1075) near Slidell

Fountainbleau Plantation, now Fountainbleau State Park and the adjoining wildlife refuge

Fairview Residence, located near Madisonville

Chinchuba, located about 7 miles east of Convington on U.S. 190

Cemetery, located about 4 miles from Slidell on La. Hwy. 433

Rouquette Monument, in a cemetery outside Lacombe

Seven Sisters Oak, the oldest and largest oak in the State, it is located on the T. L. Doby Estates in Lewisberg

Bayou Cottage, oldest home standing in the Parish, located in Madisonville

The Charles Reed Home, built in 1832, located in Covington

Ida Chapman Home, Italian architecture style, built in 1859, located in Covington

Christ Episcopal Church, built in 1847, located at the entrance of Bogue Falaya Park

The Benedictine Monastery of St. Joseph, located 3 miles above Covington on Hwy. 25

Source: Burk and Associates, 1975: 104.

TABLE 2.7

ST. BERNARD PARISH
HISTORIC, CULTURAL AND TOURIST FEATURES

National Register of Historic Places

Chalmette National Historical Park, 6 miles south of New Orleans

Historical Sites and Tourist Attractions

Lebeau House, once part of a beautiful plantation, this two story brick house is now an apartment house, located just off La. 39 in Arabi

Solis Plantation Site, located on La. Hwy. 300 above Delacroix

Turner House, a one story, cement-covered brick house built in 1853, located on La. 46, one mile east of Poydras

Kenilworth Plantation House, built in 1759, located on La. 46, 5 miles east of Poydras

Fort Martello, located at the Lake Borgne end of the Lake Borgne Canal

Delacroix Island, located at the end of La. Hwy. 300

Hopedale Sugar Chimney, the ruins of a sugar plantation refinery, located at Hopedale, on Bayou LaLoutre

Conseil Plantation Site, located off La. Hwy. 39 above Violet, La.

Battery Bienvenue, a small fort with a battery of guns, located on the right bank of Bayou Bienvenue at Bayou Villere

Old Courthouse, located in St. Bernard at the junction of La. Hwys. 39 and 46

Phillippon Plantation Slave Quarters, located just above Poydras on La. Hwy. 39

Meraux House, located at 224 Angela Avenue, Arabi

Site of LaMaison des Jalousies, located on North Peters St., Arabi

Three Oaks Plantation, a cement-covered brick house, built in 1840, located on North Peters Road, Arabi

ST. BERNARD PARISH (Cont'd.)

The Old Roy Estate, located on North Peters Street, Arabi

George Villere House, built in the 1840's of Greek Revival style, located at 7417 North Peters Street, Arabi
Marker from War of 1812, located on La. Hwy. 39 south of the junction with La. Hwy. 47
Site of the Old Macarty House, now a part of the Chalmette Slip
The LaCoste House, located off La. Hwy. 39 below Chalmette

Bienvenue and Chalmette Plantation Site, located on the edge of the Chalmette battlefield, Chalmette
Versailles Plantation Ruins, this plantation was built in 1805 and burned in 1876. It was the site of the planned city of Versailles that was never developed. It is located below Chalmette battlefield
Rene Beauregard House, built in 1840, this 2 1/2 story home is the headquarters for Chalmette National Historic Park
Pakenham Oaks, part of the Battle of New Orleans was fought under these oaks which extend from the ruins of Versailles plantation to the river
Fort Beauregard, a small fort established in the 1770's, located near Shell Beach on the south shore of Lake Borgne
Contreras Site Monument, birthplace of P.G.T. Beauregard, located on La. Hwy. 46
St. Bernard Cemetery, located opposite St. Bernard Catholic Church, just out of St. Bernard
Creedmore Plantation Sugar House Site, located out of St. Bernard
Ducros Museum, located at St. Bernard, La.
Poydras Plantation Site, located off La. Hwy. 39 at the junction with La. Hwy. 46

Source: Burk and Associates, 1975: 107-108.

TABLE 2.8

ORLEANS PARISH
HISTORIC, CULTURAL AND TOURIST FEATURES

National Register of Historic Places

Big Oak-Little Oak Islands, northeast part of New Orleans; Big Oak is on the east side of Roger's Lagoon, 1.7 miles east of Little Woods; Little Oak is 2.6 miles east of Little Woods.
Bank of Louisiana, 334 Royal Street
The Cabildo, Jackson Square, Chartres Street, and St. Peter Street
Cable, George Washington House, 1313 Eighth Street
French Market-Old Meat Market, 800 Decatur Street
French Market-Old Vegetable Market, 1000 Decatur Street
Gallier House, 1132 Royal Street
The Garden District, bounded by properties fronting on Carondelet St. on the north, Josephine St. on the east, Magazine St. on the south, and Louisiana Ave. on the west.
General Laundry Building, 2512 St. Peter St.
Girod Nicholas House, 500 Chartres St.
Hermann-Grima House, 818-820 St. Louis St.
Jackson Square (Place d'Armes), bounded by Decatur, St. Peter, St. Ann, and Chartres Streets
Lafayette Cemetery No. 1, 1400 Washington Ave.
Lafitte's Blacksmith Shop, 941 Bourbon St.
Lower Garden District, New Orleans
Madame John's Legacy, 632 Dumaine St.
Merieult House, 533 Royal St.
Old Ursuline Convent, 144 Chartres St.
Old U.S. Mint, New Orleans, 420 Esplanade Ave.
Perseverance Hall, 901 St. Claude Ave.
Pilot House (Ducayet House), 1440 Moss St.
The Presbytere, 713 Chartres St.
Rabassa, Jean Louis House, (McDonogh No. 18 School Annex), 1125 St. Ann St.
St. Alphonsus Church (Roman Catholic), 2029 Constance St.
St. Charles Line (Streetcar), St. Charles and Carrollton Avenues route
St. Mary's Assumption Church, 2030 Constance St.
Turpin-Kofler-Buja House, 2319 Magazine St.
U.S. Court of Appeals-Fifty Circuit, 600 Camp St.

TABLE 2.8 CONTINUED

ORLEANS PARISH (Cont'd.)

U.S. Custom House, 423 Canal St.
Vieux Carre Historic District, bounded by the Mississippi River
Rampart St., Canal St., and Esplanade Ave.
Fort Pike, north of New Orleans off U.S. 90 at the Rigolets

Historic Sites and Tourist Attractions

Since there are so many historic sites in New Orleans, they were not listed and mapped. Their locations and descriptions have been documented in numerous publications. Two well-known sources are:

New Orleans. Carolyn Kolb
Doubleday, Garden City, N.Y., 1972

New Orleans City Guide. 1939
Houghton Mifflen, Boston.
Federal Writer's Project.

Source: Burk and Associates, 1975: 105-106.

TABLE 2.9

JEFFERSON PARISH
HISTORIC, CULTURAL & TOURIST FEATURES

National Register of Historic Places

Fort Livingston, northeast of Grand Isle on western tip of Grand Terre Island

Historical Sites and Tourist Attractions

Derbigny, house located on River Road above Westwego
Elmwood, one of the oldest mansions in the Deep South, located near Huey Long Bridge on La. Hwy. 48
Grandpere, fourth oldest live oak tree in the U.S. located near Harahan
Jefferson Downs, race track located in New Orleans
Kenner Plantation, site of the city of Kenner on La. Hwy. 48

Lafitte Cemetery, cemetery near Lafitte said to be the burial places of both Napoleon and John Paul Jones
Waggaman Cemetery, containing large brick tombs, located in Waggaman
Seven Oaks, house located on La. 18 above Westwego
Tchoupitoulas, house built in 1820, now the clubhouse of the Colonial Country Club
Harvey Locks, linking the Mississippi River and the Intracoastal Waterway at Harvey
Ames Plantation Site, located on La. Hwy. 18, Marrero
Berthoud Cemetery, located off La. Hwy. 45 in the town of Barataria
Barataria Lighthouse, located on Grand Terre Island near Grand Isle.

TABLE 2.9 CONTINUED

JEFFERSON PARISH (Cont'd.)

Fleming Plantation and Sugar House Chimney located on the east bank of Bayou Barataria

Cedar Grove Plantation, located on River Road in Waggaman

Madonna Manor and Hope Haven, located off La. Hwy. 45 in Marrero

Louis Chighizola House, the house of Lafitte's Lieutenant, located in Grand Isle

Grand Isle Cemetery, old tombs among large oak trees, located at Grand Isle

Our Lady of Grand Isle Church Bell, located in Grand Isle

St. Anthony Cemetery, located in the town of Barataria, on the west side of the bayou near the bridge

Magnolia Lane, house located on River Road one mile north of Huey Long Bridge

Rathborne Plantation Houses, antebellum cottages facing the river below the Harvey Canal

Rosedale Plantation House, located near River Road, just 1 mile below the Huey P. Long Bridge

Oak Lawn Plantation House, located off Jefferson Hwy., about 2 miles below the Huey P. Long Bridge

Camp Parapet Powder Magazine, located on U.S. Hwy. 90

Whitehall Plantation House, just east of Huey P. Long Bridge

McDonough Monument, located in the McDonoughville Cemetery, Hancock and Semmes Streets, Gretna

Plantation Cottage, located on River Road in Gretna

Mechanikham Town Commons, Old Railroad Depot, located near the Mississippi River in Gretna

Gretna Ferry and Ferry Landing, near river in Gretna

David Crockett Fire House, located on the 200 and 300 blocks of Lafayette Street, Gretna

Old Gretna Courthouse, near Mississippi River in Gretna

St. Joseph's Church, located on 7th Street, Gretna

Perpetual Adoration Convent, just off La. Hwy. 90, Gretna

Gretna Town Center, located in the Huey P. Long Ave. neutral zone, from the Mississippi River to Fourth St.

Source: Burk and Associates, 1975: 101-102.

overall catch; it does not include revenue from related industries, which increases the dock-side figure by several times. Louisiana ranks number one in pounds of seafood produced, as compared to the other 49 states. In 1975, Louisiana fishermen brought in 35 million pounds of shrimp, 10 million pounds of oysters and 23 million pounds of crabs (Beth Taylor, 1976).

Comparing the figures for the 1975 shrimp catch with the figures in Table 2.10, which gives the shrimp catch for 1940-1974, shows a marked decline. This decline continues the pattern of fluctuation in amounts of shrimp caught that has been apparent since 1956. The decline is due in part to changes (salt water intrusion, channelization, pollution, etc.) in estuary nursery grounds, where shrimp spend considerable time (Mumphrey et al., 1976: 165-173).

The 1975 osyter catch represents a slight increase over the 1974 figure (see Table 2.11). There has been little variation in the oyster catch over the past 25 years. However, the oyster industry, too, is in danger from several sources related to activity in wetlands--pollution from oil spills, predators, etc., as discussed in Mumphrey et al. (1976: 173-179).

Louisiana's biggest money-making fish is the menhaden, which is also the most valuable commercial fish in the United States. The menhaden has a very high oil content, which is the major reason it is used only for commercial purposes, such as manufacturing margarine and paints. It is also

TABLE 2.10

LOUISIANA SHRIMP CATCH, 1940-1974

Year	Quantity (1000 lbs.)	Value (1000 $)
1940	90,820	3,645
1941*		
1942*		
1943*		
1944*		
1945	103,352	12,402
1946*		
1947*		
1948	79,966	16,827
1949	77,046	17,662
1950	70,630	14,696
1951	78,164	17,587
1952	75,854	15,722
1953	81,589	16,427
1954	77,709	15,451
1955	68,986	13,745
1956	56,886	15,316
1957	31,917	9,660
1958	39,760	13,080
1959	57,036	12,803
1960	61,758	15,881
1961	31,027	8,913
1962	43,585	14,985
1963	80,809	19,789
1964	59,382	18,794
1965	62,593	19,584
1966	62,276	24,390
1967	75,325	24,575
1968	67,768	25,623
1969	82,888	33,358
1970	90,948	34,614
1971	92,481	43,285
1972	83,035	47,066
1973	58,653	44,513
1974	59,591	32,206**

*Data not available for these years

**As it appears in source.

Source: Mumphrey _et al_., 1976: 168.

TABLE 2.11

LOUISIANA OYSTER CATCH 1940-1974

Year	Pounds (in thousands)	Unprocessed Value
1940	12,412.2	$ 694,875
1941*		
1942*		
1943*		
1944*		
1945	9,884.1	2,829,007
1946*		
1947*		
1948	9,016.3	3,157,393
1949	9,687.5	3,459,341
1950	8,715.4	2,842,603
1951	8,163.7	1,902,647
1952	11,401.6	3,075,141
1953	9,435.3	2,672,664
1954	8,361.1	2,350,270
1955	9,394.9	2,753,177
1956	10,056.1	2,238,034
1957	10,489.3	2,756,098
1958	8,264.8	2,425,917
1959	9,667.5	2,645,124
1960	8,310.8	2,303,997
1961	10,139.2	2,849,090
1962	10,160.3	3,316,554
1963	11,563.2	3,720,113
1964	11,401.1	2,976,152
1965	8,342.7	2,401,607
1966	4,764.0	2,156,000
1967	7,743.0	3,414,000
1968	13,122.0	5,305,000
1969	9,178.0	3,969,000
1970	8,639.0	3,631,000
1971	10,528.0	4,638,000
1972	8,805.0	4,457,000
1973	8,953.8	5,545,022
1974	9,971.2	6,347,912

*Note: Data not available for these years.

Source: Mumphrey et al., 1976: 179.

used for feeding a variety of agricultural and domestic animals. The preliminary estimate for 1975 is a catch of 984,105,000 pounds, at a value of $29.4 million (Allen, 1976). The steady increase in the menhaden catch since it was introduced in the state in 1948 is reflected in Table 2.12. Menhaden are dependent on wetlands for nutrients (Mumphrey et al., 1976: 180-186).

In the New Orleans area, Lake Pontchartrain is the most frequently fished waterway. Ranked fourth in state production, the lake brought in $1,360,303 (unprocessed seafood value) in 1975. For 1975, the lake produced 83,000 pounds of fish, 711,000 pounds of crabs (including soft shelled), and 336,000 pounds of shrimp for a total of 1,130,000 pounds (Taylor, 1976).

Trapping is also a productive venture, with Louisiana leading the nation in fur production. Louisiana accounts for 40-65 percent of the total U.S. catch. The unprocessed value of the 1974-75 season was $10.8 million (see Table 2.13). Nutria now replaces muskrat as the most valuable fur animal in the state. Muskrat and nutria and other animals live in coastal marsh areas and depend on the wetlands for food and habitat (Mumphrey et al., 1976: 187-191).

Because the fishing and fur industries in the area are productive, preservation of the wetlands is important. The wetlands serve as nursery, habitat and source of nutrients for many fish and fur animals.

TABLE 2.12

MENHADEN CATCH FOR LOUISIANA

Year	Catch (1000 pounds)	Value (in thousands $)
1948	88,110	*
1949	165,914	*
1950	207,755	*
1951	209,574	*
1952	283,373	2,765
1953	307,492	3,690
1954	270,094	3,727
1955	298,309	4,594
1956	320,521	4,840
1957	162,817	2,459
1958	241,813	3,627
1959	442,740	*
1960	470,108	*
1961	581,682	6,748
1962	689,157	7,994
1963	633,484	7,862
1964	599,538	9,046
1965	682,435	11,790
1966	555,852	9,558
1967	510,414	6,134
1968	622,291	7,740
1969	856,251	12,764
1970	959,810	18,931
1971	1,237,093	20,015
1972	928,252	15,279
1973	894,931	37,221
1974	1,079,304	39,539

*NOTE: Data not available for these years.

Source: Mumphrey et al., 1976: 181.

TABLE 2.13

LOUISIANA FUR CATCH, 1974-1975 SEASON

Category	Number of Pelts	Approximate Price to Trapper	Unprocessed Value
Muskrat (Eastern)	240,214	$ 3.25	$ 780,695.50
Muskrat (Western	60,000	4.50	270,000.00
Mink	32,319	4.50	145,435.50
Nutria (Eastern)	1,000,000	4.50	4,500,000.00
Nutria (Western)	502,617	5.50	2,764,393.50
Raccoon (Coastal)	70,000	4.00	280,000.00
Raccoon (Upland)	90,863	7.00	636,041.00
Opossum	30,447	1.50	45,670.50
Otter	6,118	25.00	152,950.00
Skunk	298	1.00	298.00
Fox	3,471	16.00	55,536.00
Bobcat	775	25.00	19,375.00
Beaver	276	5.00	1,380.00
Coyote	342	10.00	3,420.00
TOTAL PELTS	2,038,379		$9,655,195.00
Nutria Meat	9,000,000 lbs.	.09	$ 810,000.00
Muskrat Meat	250,000 lbs.	.09	22,500.00
Raccoon Meat	930,000 lbs.	.30	279,000.00
Opossum Meat	250,000 lbs.	.25	62,500.00
TOTAL MEAT	10,430,000 lbs.		$1,174,000.00
TOTAL PELTS AND MEAT			$10,829,195.00

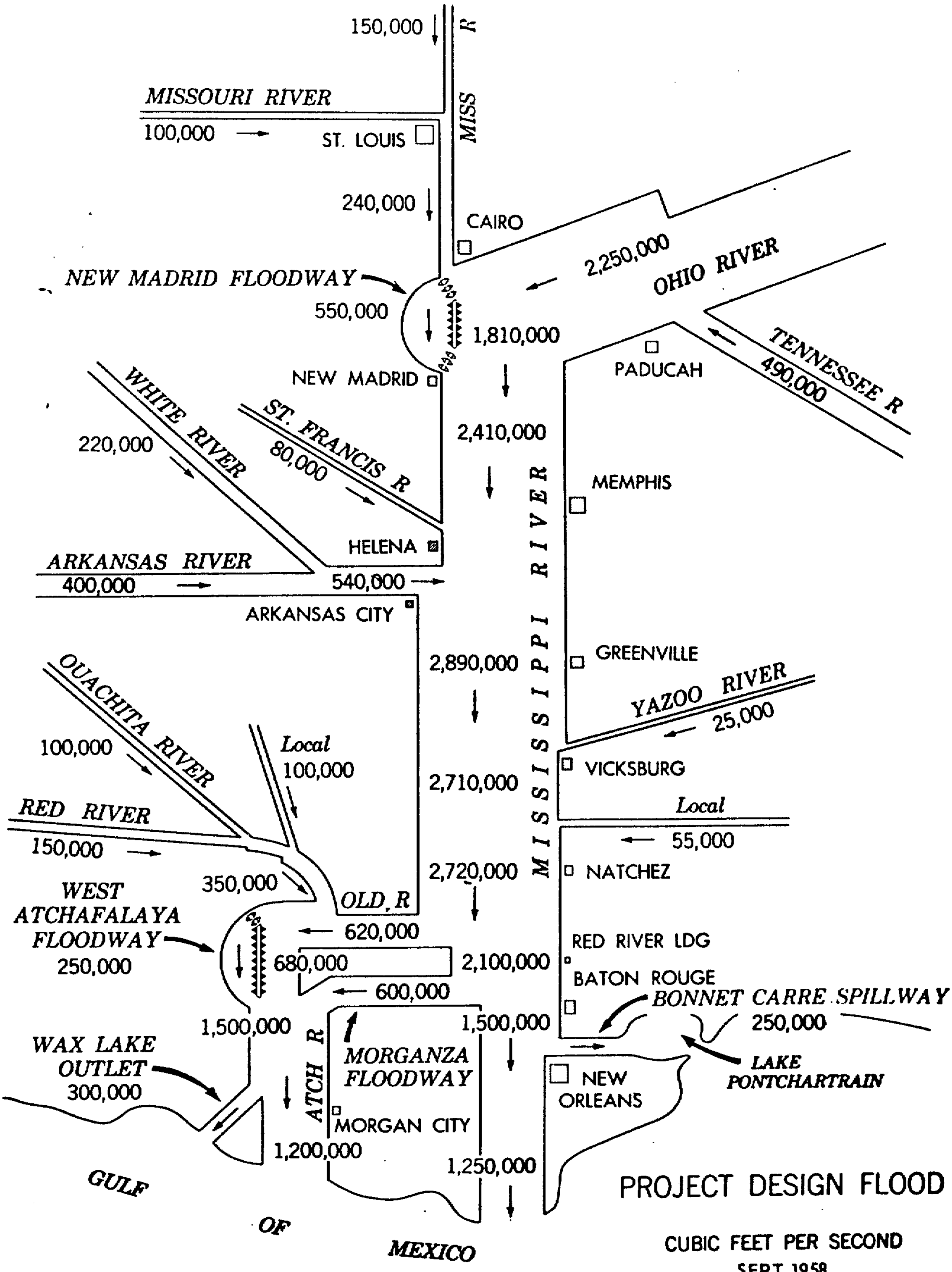
Source: Mumphrey *et al.*, 1976: 189.

Flood and Storm Protection

The flood of 1927 was the most disastrous in the history of the Lower Mississippi River Valley. An area of about 26,000 square miles was inundated. This disaster awakened the nation to the dire need for flood control in the lower valley. Out of it grew the Flood Control Act of 1928, which committed the Federal Government to a definite program of flood control. The Act of 1928 authorized the expenditure of $325 million for construction of a federal project to provide flood control in the alluvial valley of the lower Mississippi River, as well as navigation from Cairo to New Orleans. Local interests were charged with furnishing rights-of-way for levees and maintaining them after construction. Subsequent legislation has resulted in modifications to the 1928 Act. The flood control plan is known as the Mississippi River and Tributaries Project.

The four main elements of the plan are levees for containing flood flows; floodways for the passage of excess flows past critical reaches of the Mississippi; channel improvements and stabilization for stabilizing the channel in order to provide an efficient navigation alignment, increase the flood-carrying capacity of the River, and for protection of the levee system; and tributary basin improvements for major drainage and flood control, such as dams and reservoirs, pumping plants, auxiliary channels and the like (U.S. Army Corps of Engineers, 1973: 4, 9). Figure 2.4 gives a schematic representation of the project as it was in 1958.

FIGURE 2.4



Source: U.S. Army Corps of Engineers, 1973: 7.

Flood control plans such as the Mississippi River and Tributaries Project make reclamation of wetland areas feasible. When it became technologically possible to build a levee and artifically drain an area, keeping the water out by channeling it into leveed sea-level canals for transport to Lake Pontchartrain, then the City of New Orleans was able to grow beyond its natural levee. The pattern of urbanization in New Orleans has been to reclaim wetlands first to the north to Lake Pontchartrain, then to the west in Jefferson Parish, and now to the east in Orlandia (Mumphrey et al., 1975: 63-64).

Since the New Orleans SMSA contains large areas of wetlands in their natural state (see Table 2.14), it is important to understand the ecological effects that reclamation has on wetlands. The following list of cause-effect relationships has been attributed to the man-induced stress of reclaiming wetlands in Louisiana:

1. Irreversible loss of land to the estuary
   a. loss of habitat for birds, fish, reptiles, etc.
   b. loss of nursery areas for birds and fish
   c. loss of detritus to the estuary
   d. loss of nutrient input into the estuary
   e. resultant loss in natural productivity
   f. loss of fresh water
2. Loss of productive capacities that benefit man
   a. reduced assimilative capacity of water to absorb pollutants
   b. reduced commercial and sport fishing activities due to decreased total productivity

TABLE 2.14

CLASSIFICATION OF LAND IN THE NEW ORLEANS REGION
(Pre-Urbanization)

Parish	Pleistocene Uplands (in square miles)	Mississippi Natural Levee Deposits (in square miles)	Wetlands (Swamps and Marsh) (in square miles)	Total Parish Area (in square miles)
Orleans	0	24	175	199
Jefferson	0	54	355	409
St. Bernard	0	39	471	510
St. Tammany	636	0	273	909
TOTAL	636	117	1274	2027

Source: Mumphrey _et al_., 1975: 66.

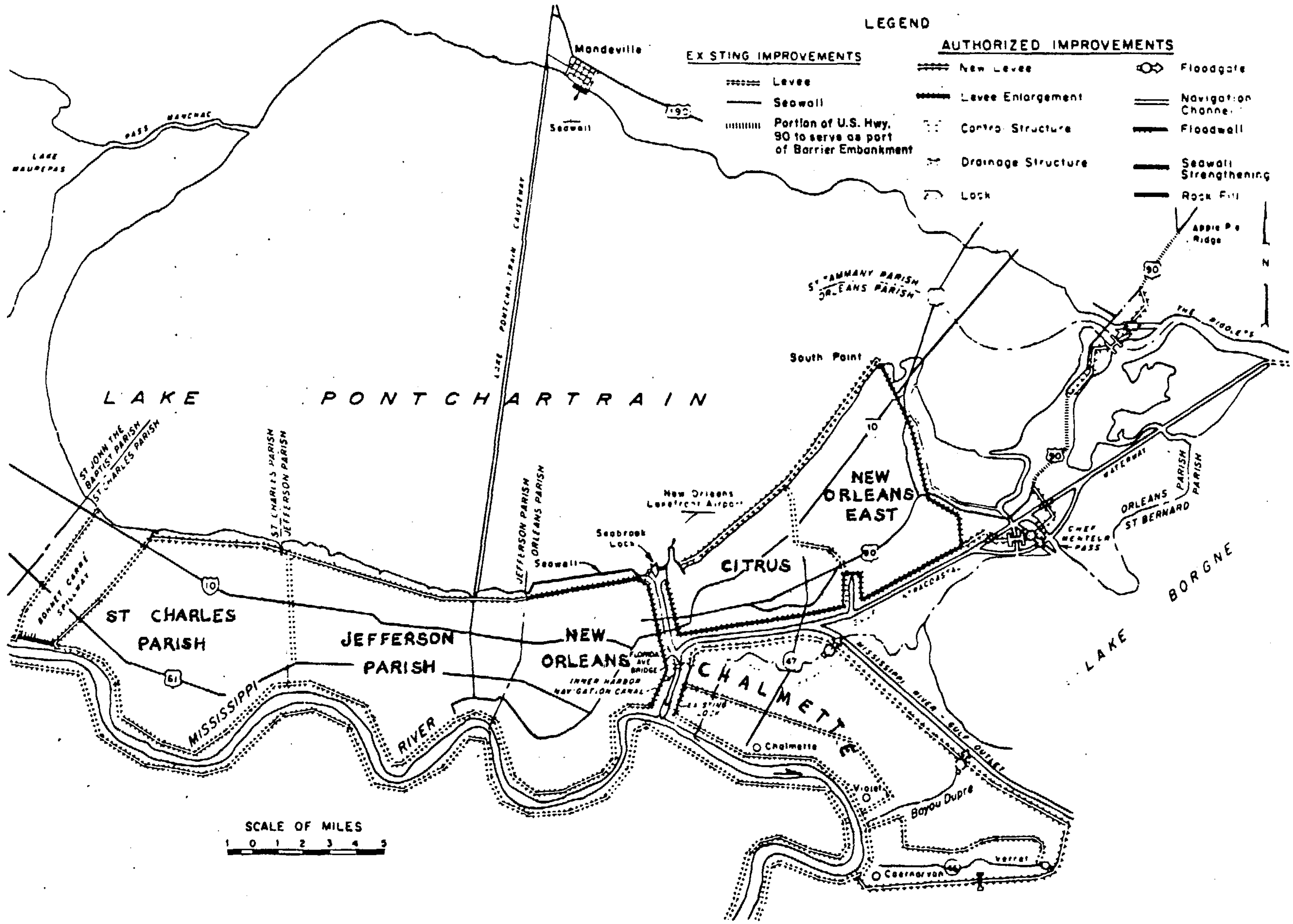
c. loss of relatively cheap, effective municipal sewerage treatment by wetlands
d. accelerated loss of wetland to the ocean
e. loss of a buffer zone against tropical storms (Mumphrey et al., 1975: 64).[1]

New projects under the flood control plan continue to drain more acres of marsh and swamp areas. One of these projects is the Lake Pontchartrain and Vicinity Hurricane Protection Plan on which is predicated the development of Orlandia, a 28,000 acre residential-industrial-commercial complex planned for eastern New Orleans. The hurricane protection plan will entail a direct loss of 5,265 acres of wetlands due to actual construction. An additional 31,020 acres of marsh, swamp and water in its natural state, mainly in the Chalmette region, will be lost to the estuary behind the new levees. In eastern New Orleans, 14,904 acres of wetlands will be open to reclamation after being protected by the new levee-lock system. Some of this land north of the I-10 expressway (3,250 acres) has retained its viability (Mumphrey et al., 1975: 68).

Costing an estimated $327 million, the project was begun in 1967 and is scheduled to be completed by 1991. Figure 2.5 shows the details of the project, which consists of a combination of levees and flood control structures built in various locations along the shores of Lakes Pontchartrain and

[1]A full discussion of these ecological effects on the estuarine system may be found in Mumphrey et al., 1975: 76-82.

FIGURE 2.5



LAKE PONTCHARTRAIN AND VICINITY HURRICANE PROTECTION

Source: Louisiana Advisory Commission, 1973: 93.

Borgne to protect developed areas from hurricane tides. Floodwalls and levees along the Inner Harbor Navigation Canal, Mississippi River-Gulf Outlet, and in Chalmette are presently under construction with many completed. To limit uncontrolled entry of hurricane tides into Lake Pontchartrain, barrier complexes will be built across the tidal passes of the Lake, at Seabrook, Chef Menteur and Rigolets. The proposed barriers have created intense opposition from St. Tammany residents who fear the barriers would divert flood waters to their area, as well as restrict shipbuilding and recreational activities north of Lake Pontchartrain (Ciko, 1976).

Other parts of the project include building a new levee along the Citrus and New Orleans East lakeshores; improving or enlarging existing protective works on the south shore of the Lake along Gulf Intracoastal Waterway and the Inner Harbor Navigation Canal; strengthening the Mandeville Seawall; constructing a lock at Lake Pontchartrain's junction with the Inner Harbor Navigation Canal; and constructing a new levee along the Mississippi River-Gulf Outlet extending from the Inner Harbor Navigation Canal to about six miles southeast of Bayou Dupre, around Verret and west to Caemarvon; and building a drainage structure at Creedmore Canal (U.S. Army Corps of Engineers, 1975: 88).

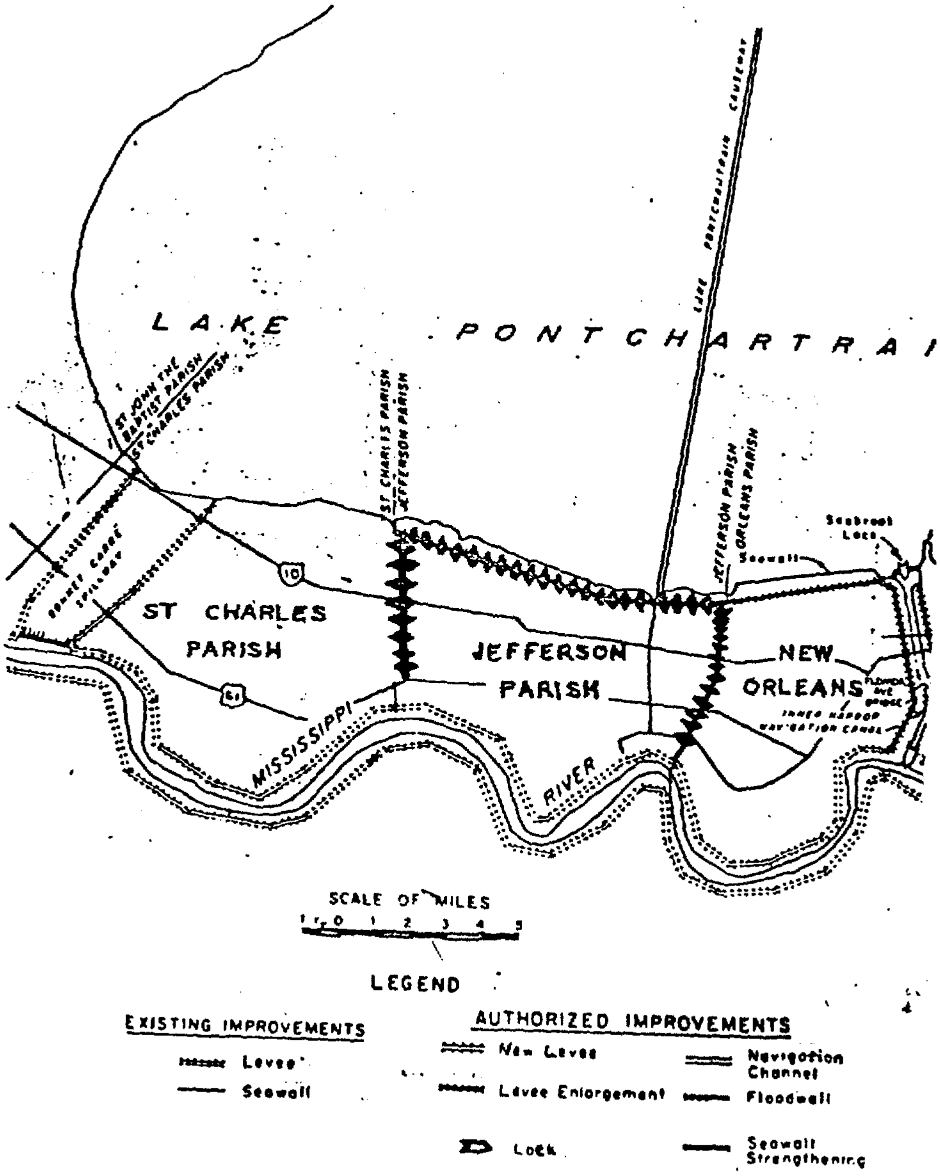
The Lake Pontchartrain Levees project was completed in 1956 at a cost of $8.3 million, including a cash contribution of $1.35 million by local parishes. The project includes construction of 10.2 miles of levee along the Lake

Pontchartrain shoreline of Jefferson Parish; enlargement of 4.8 miles of levee along the Jefferson-St. Charles Parish line, and enlargement of 2.3 miles of the 17th Street Canal levee along the Jefferson-Orleans Parish line (see Figure 2.6). These levees protect about 50 square miles of residential land and industrial development in Jefferson Parish from storm tides in Lake Pontchartrain. As a result of these levees, population in the area increased dramatically, from 54,000 in 1950 to 200,000 in 1973. After Hurricane Betsy in 1965, the Pontchartrain Levee District raised the levees to provide added protection, at a cost of over $2.3 million. Project maintenance in this area is the responsibility of the Pontchartrain Levee Board (U.S. Army Corps of Engineers, 1975: 90).

The Harvey Canal-Barataria Levee project consists of construction of a levee along the Gulf Intracoastal Waterway in Jefferson Parish between Roussel Pumping Station and Cousins Canal, enlargement of the existing levee from Cousins Canal to Mile 6, and a new levee from Mile 6 to Louisiana State Highway 45 near Crown Point. The plan also calls for construction of a new pumping station by local interests. The estimated project cost is $1 million Federal, and $5.02 million non-Federal. The first phase of the project was completed in 1974. The second phase is scheduled to begin in 1976 (U.S. Army Corps of Engineers, 1975: 105). The land protected by the levee is zoned industrial, and is used primarily for petro-chemical supporting facilities (Terranova, 1976).

FIGURE 2.6

LAKE PONTCHARTRAIN LEVEES

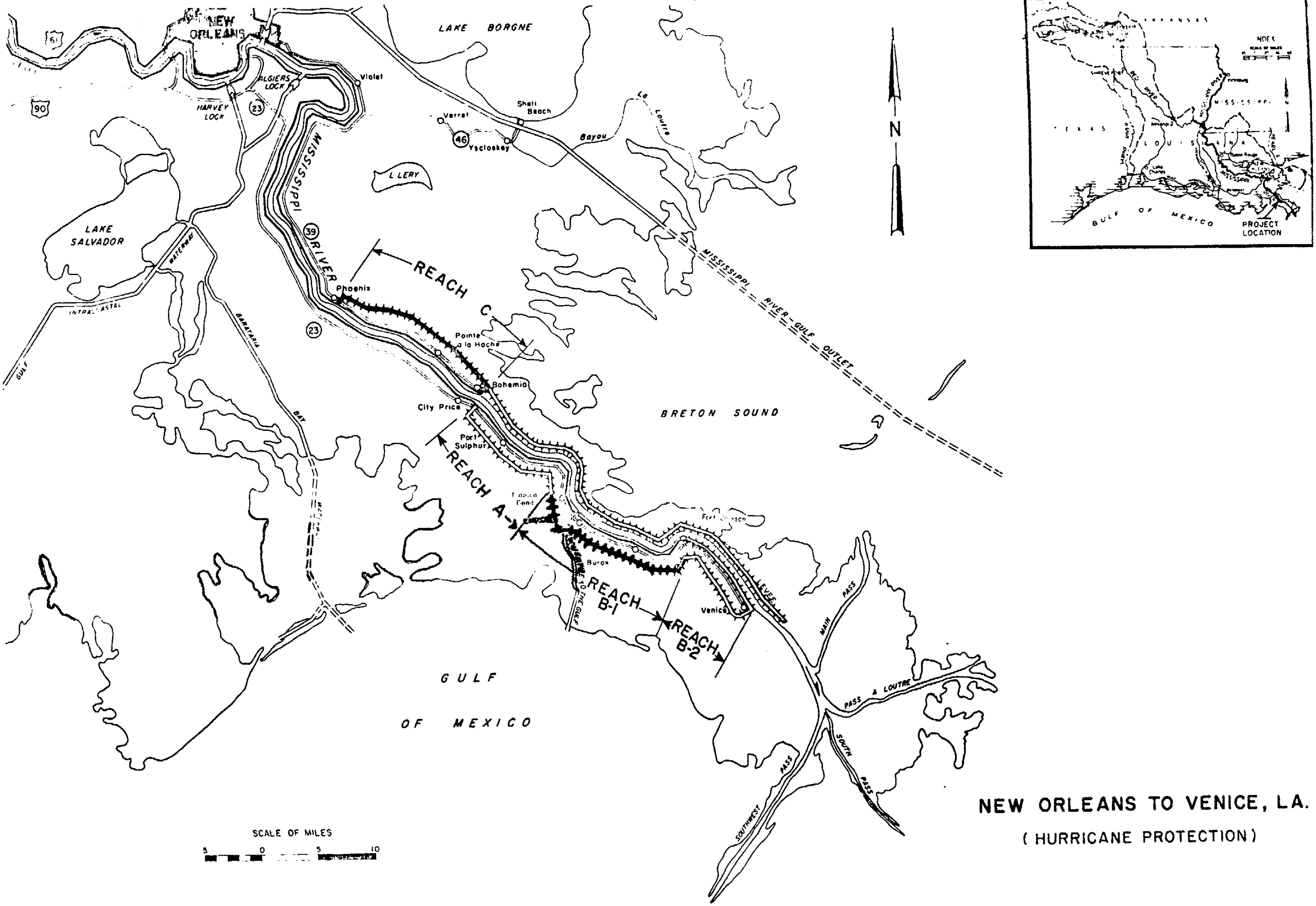


Source: Adapted from the Louisiana Advisory Commission, 1973: 93.

The New Orleans to Venice Hurricane Protection Project is to provide increased protection for four reaches along the Mississippi River below New Orleans. Features of the project include increasing the height and cross-section of the existing back levees, constructing new back levees, and modifying existing drainage facilities. A barrier levee on the east bank of the Mississippi River is to be constructed to exclude tidal surges which might come across the marshes to the east (see Figure 2.7). The total project costs are estimated to be $80.5 million for the Federal Government and $34.5 for non-Federal interests. Planning is under way for all reaches. Construction was initiated in August 1968 on Reach B-1 and on Reach B-2 in July 1974. The initial phase of construction on Reach C levee was accomplished to an interim grade by local interests and will be accomplished to design grade jointly by local interests and the Corps of Engineers (U.S. Army Corps of Engineers, 1975: 107-109).

The parishes in the New Orleans region may experience flooding from the Mississippi River, from watershed tributaries along the main artery of the Mississippi River, from tidal surges associated with hurricanes and tropical storms, as well as from ponding of rainfall runoff and tidal overflow (U.S. Army Corps of Engineers, 1974: 21-22). It is not uncommon to have streets flooded above the curb line and drainage canals flowing at full capacity following heavy rainfalls. All rainfall runoff must be pumped through the outfall canal system into adjacent tidal waters. In many

FIGURE 2.7



Source: Louisiana Advisory Commission, 1973: 99.

cases, pumping capacity is not adequate to handle high intensity storms of several hours duration. The parishes have constructed a number of improvements that provide land drainage and protection against flooding.

The Sewerage and Water Board of New Orleans, for example, must pump 5.01 x 10^9 cubic feet of water each year into Lake Pontchartrain to maintain the City. Without the elaborate pumping system, the City would conceivably flood with each rain. Pumping the drainage water into the Lake, with its high nutrient content in the form of sewerage, increases the content of such organisms as coliform and salmonella bacteria. The Lake has had to be closed to swimmers several times due to the threat of infection from this bacteria (Mumphrey et al., 1975: 53-55).

Ponding has been aggravated also by the development of organic soils for urban uses. Initial subsidence that takes place when the soils are drained, and annual subsidence of one-half to two inches per year thereafter, has resulted in elevations of as much as eight feet below sea level (U.S. Army Corps of Engineers, 1974:22).

Major Navigation Canals

The port of New Orleans has served historically as a vital link between the central interior of the nation and the sea. Among United States ports, New Orleans is second only to New York in tonnage handled and is the largest port on the Gulf of Mexico. In 1974, the New Orleans Port accounted for

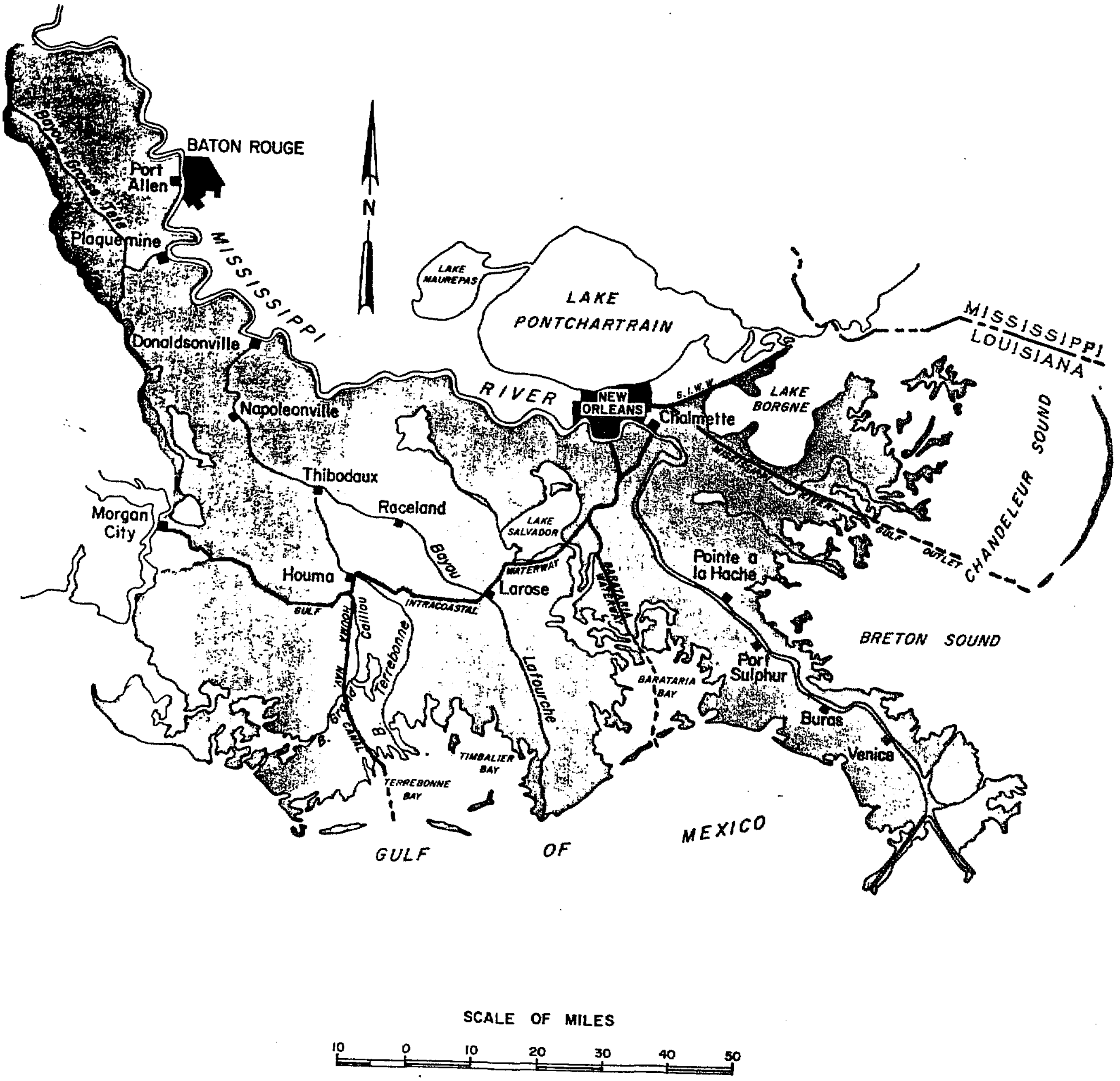
7.7 million tons of general cargo (Board of Commissioners, Port of New Orleans, 1974: 12). Aside from deep-draft ocean shipping, the New Orleans area is a key focal point for Inland waterway traffic. Inland barge traffic not only links the deep water ports to the interior of the nation, but also provides important support for the industrial structure of the coastal region in Louisiana (Louisiana Advisory Commission, 1973: 64). Some of the important navigable waterways in the region that will be discussed below are the Mississippi River Gulf Outlet (MRGO), The MRGO-Michoud Canal, the Gulf Intracoastal Waterway, the Houma Navigation Canal, the Barataria Bay Waterway (see Figure 2.8), the channels of Bayous LaLoutre, St. Malo and Yscloskey, Bayou Lacombe and Bayou Dupre (see Figure 2.9), the Tchefuncte River and Bogue Falaya Waterway, Bayou Bonfuca, and the Pearl River Waterway (see Figure 2.10).

As important as canals for water transportation may be, channelization poses a serious threat to the ecological balance of the estuarine system. Canals and other man-made channels in the state are over 63 percent of the length of natural bayous and passes. They have resulted in the direct destruction of 42,104 acres of wetlands. Indirectly, they have resulted in the destruction of larger tracts of estuarine lands (Mumphrey et al., 1975: 82). The channels that criss-cross the wetlands have had these negative effects upon them:

1. interfering with sheetwater flow through the marsh;

FIGURE 2.8

MAJOR NAVIGATION CANALS



Source: U.S. Army Corps of Engineers, 1975: 100.

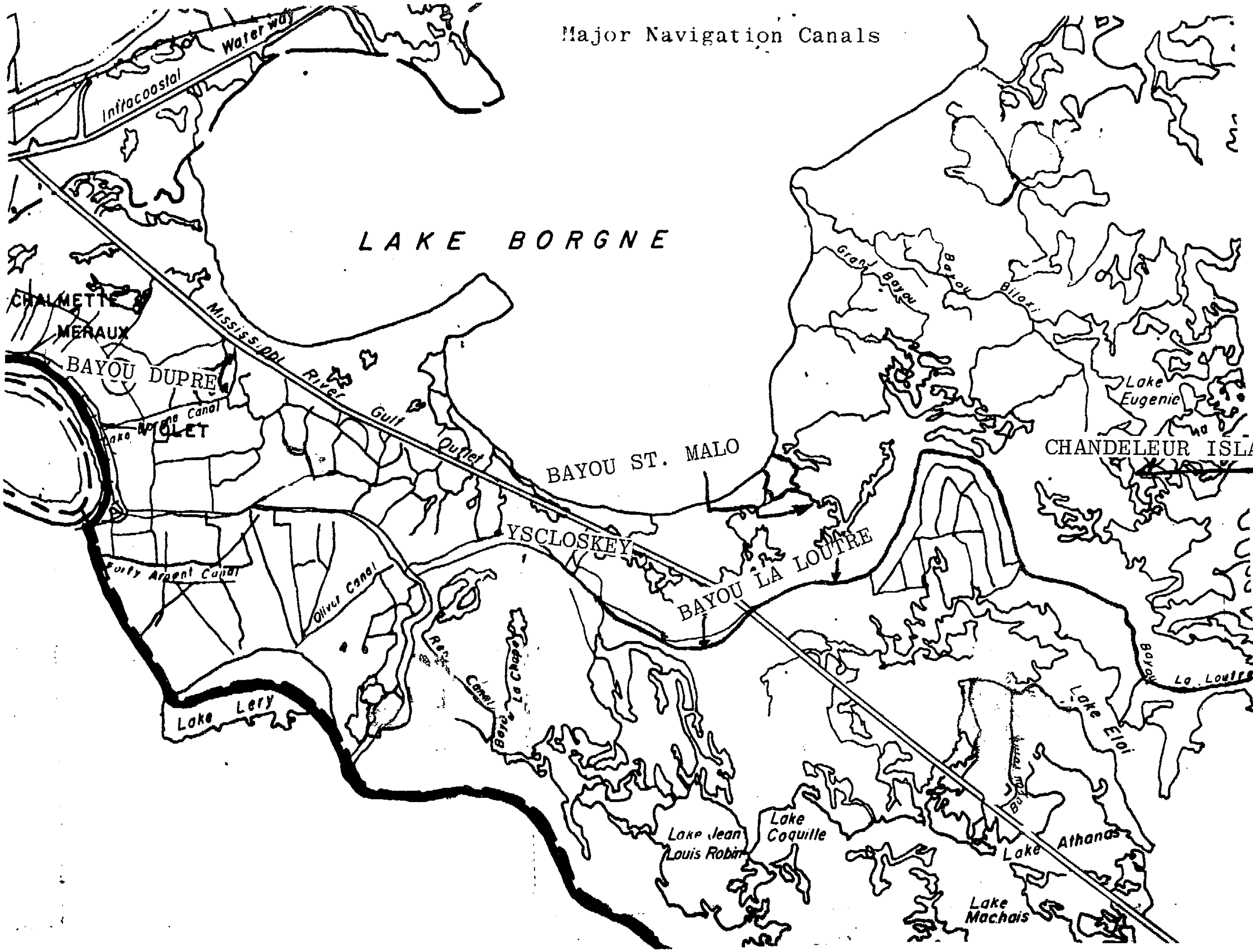
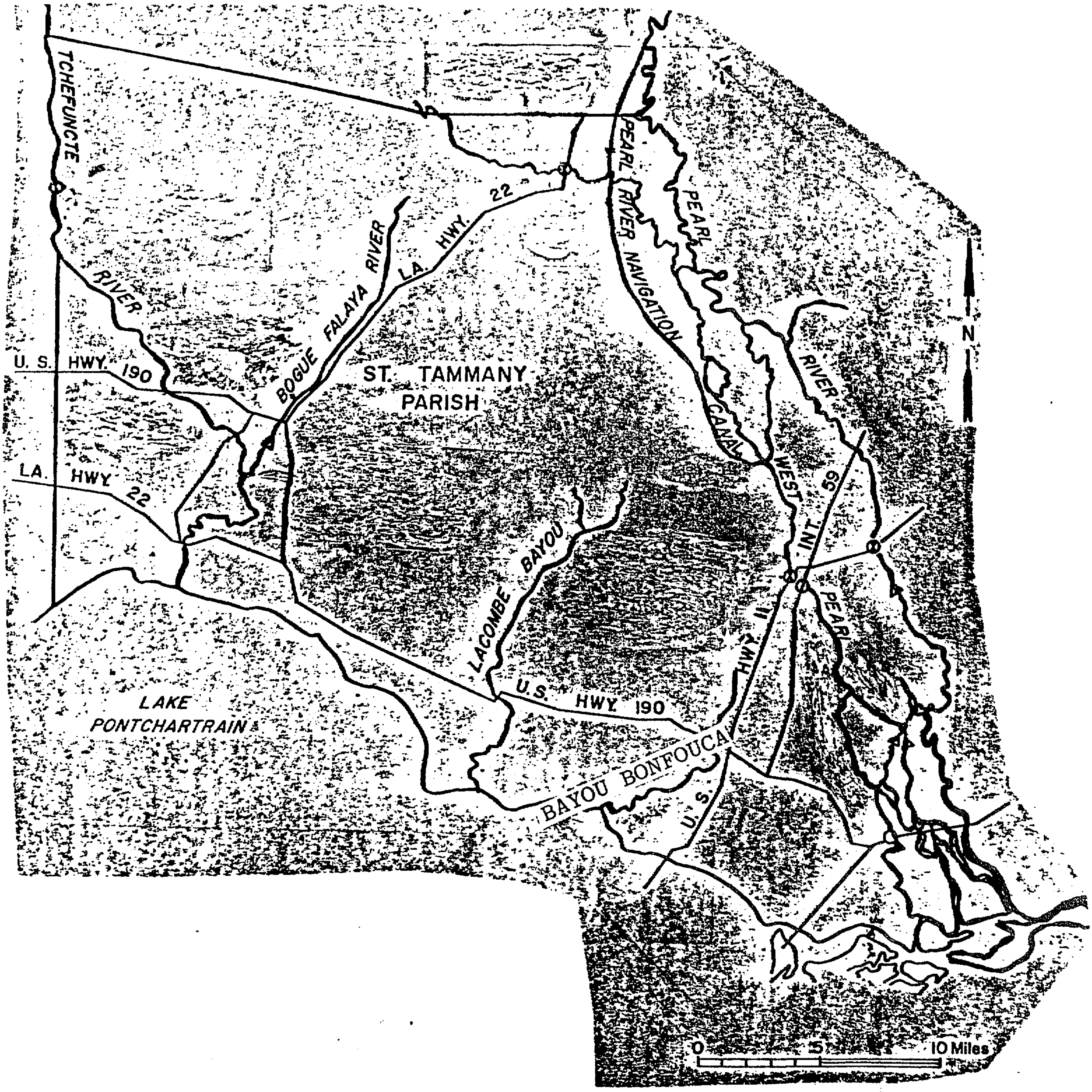


FIGURE 2.9

Source: Burk and Associates, 1973: 80.

FIGURE 2.10

Major Navigation Canals



Source: Professional Engineering Consultants Corps, 1972: 35.

2. allowing rapid salinity changes with the resultant death of vegetation and erosion of the marsh;
3. allowing destruction of marsh by wave action;
4. decreasing productivity by the presence of straight vs. sinuous channels that accelerate removal of freshwater and also confine water movement;
5. destruction of barrier islands with resultant increased destruction of marsh (Mumphrey _et al_., 1975: 86).[2]

These negative effects result in decreased wetland productivity due to loss of the essential components of marsh--detritus,, sheetflow, broad fresh-salt interface--that are one of the prerequisites of a productive biologic system in the wetlands (Mumphrey _et al_., 1975: 93).

The _Mississippi River-Gulf Outlet_ affords a tidewater outlet to the Gulf that is about 37 miles shorter than the Mississippi River route. Sailing time, ship turnaround time, navigation hazards, and congestion were intended to be reduced by the project. The project, completed in 1968, consists of a ship channel 36 feet deep and 500 feet wide extending approximately 76 miles in a land and water cut from the junction of the Inner Harbor Navigation Canal and the Gulf Intracoastal Waterway in New Orleans to the -38-foot contour in the Gulf. Jetties for the reduction of shoaling, a turning basin, and a lock and connecting channel with the

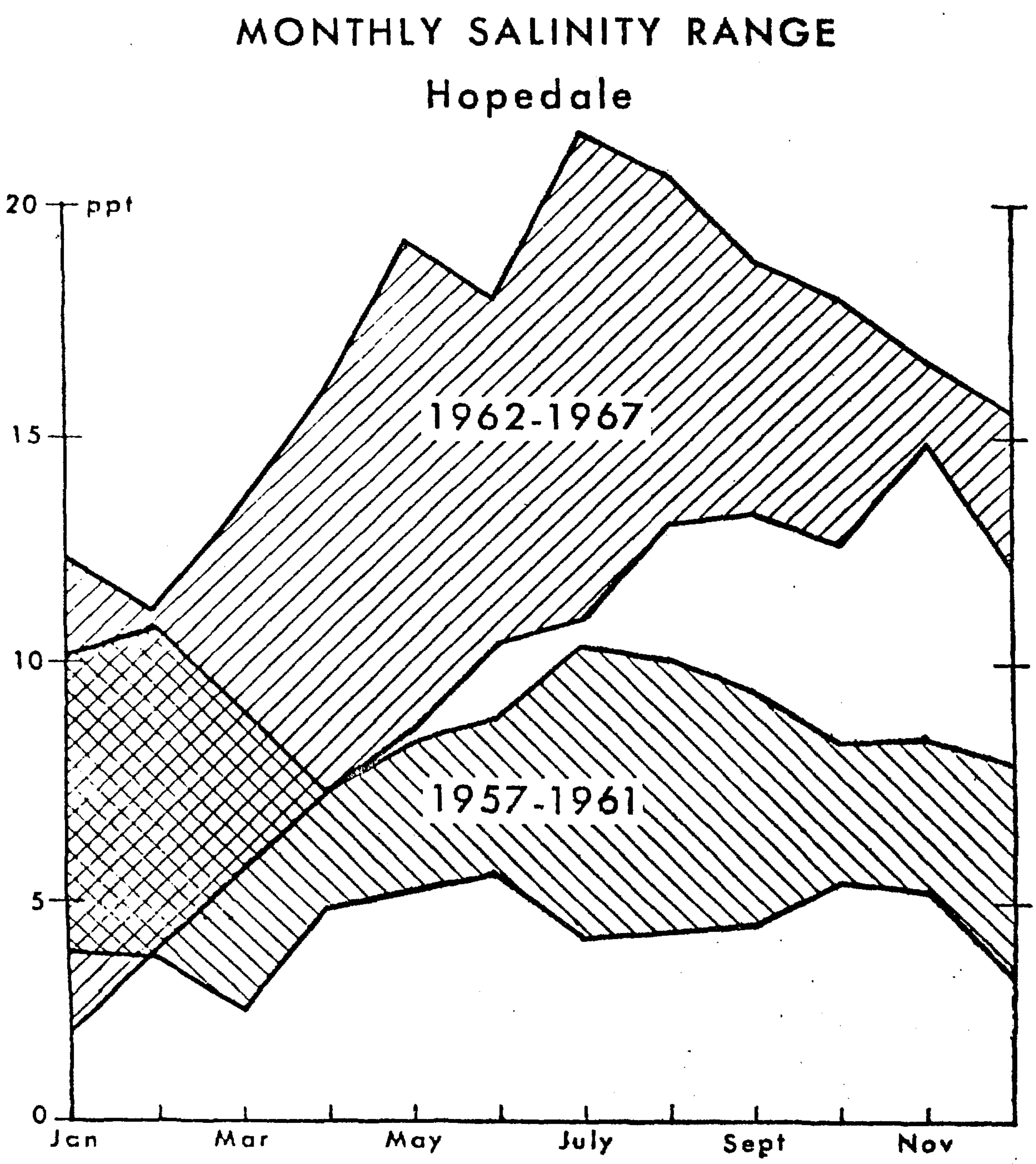
[2] A full discussion of these ecological effects upon wetlands may be found in Mumphrey _et al_., 1975: 86-93.

Mississippi River are salient features of the project. Major types of cargo moving over the channel include crude petroleum, primary metal products, and food and related products (U.S. Army Corps of Engineers, 1975: 106).

The MRGO channel provides an example of the negative effects channelization has on wetlands. The channel replaces 1680 acres of shallow open water and 4868 acres of marsh along its 70 miles from Gulf Intracoastal Waterway to the edge of the Breton Sound. The spoil areas, which are on the south of the canal, cover 4518 acres of open water and 12,540 acres of marsh. Therefore, 23,606 acres, or 36.9 square miles, of wetlands have been removed from productivity. The channel is now an arm of the sea, extending through the marsh of St. Bernard into New Orleans. There have been significant changes in the salinity of the water (see Figures 2.11 and 2.12). Salt water intrusion has shifted the shoreline of Lake Borgne to the south bank of MRGO. The increased salinity partially contributed to this deterioration of the shoreline. Land loss is also caused by natural wave action, ship-generated wake and waves, increase of tidal action and water circulation between the bayous and the canal, among other reasons (Coastal Environments, Inc., 1973: 23-27).

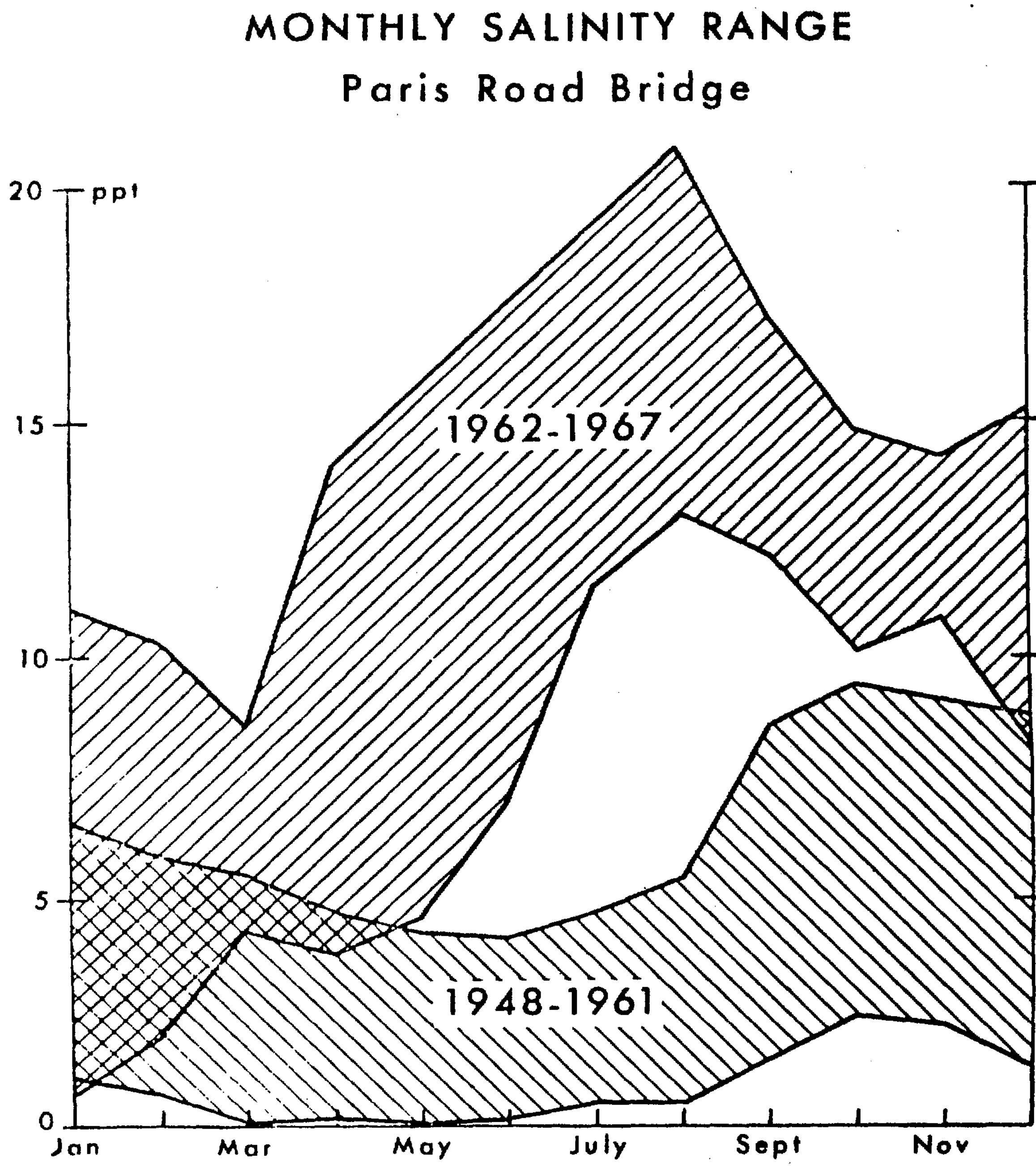
The thick sequence of poorly consolidated sediment through which the MRGO channel was excavated has created highly unstable bank conditions and massive slumping is common. The result of this condition has been a continuous

FIGURE 2.11



Source: Coastal Environments, Inc., 1972: 90.

FIGURE 2.12



Source: Coastal Environments, Inc., 1972: 91.

and costly program of maintenance dredging. This condition has also meant that MRGO has not been successful as far as its purpose is concerned. Although MRGO provides a shorter route for ocean-going vessels between the Gulf of Mexico and the Port of New Orleans, the travel time is longer because the channel is shallow and narrow. Therefore, a majority of vessels still use the Mississippi River. The proposed widening of the channel to 750 feet and deepening it to 50 feet would further accelerate bank slumping, salt water intrusion and loss of large acreages of marsh (Coastal Environments, Inc., 1972: 93).

The Mississippi River-Gulf Outlet (MRGO), Michoud Canal will provide a 36- by 250-foot ship channel to be excavated within existing water bottoms from the MRGO along a part of the Gulf Intracoastal Waterway and through the Michoud Canal. An 800- by 808-foot turning basin will be located in the northern end of the project. The cost is estimated at $3.7 million Federal and $1.06 million non-Federal (U.S. Army Corps of Engineers, 1975: 106-107).

Through the interconnection with the Mississippi River system and other important inland waterways, the Gulf Intracoastal Waterway enables small craft and commercial tows to reach many points throughout the eastern and southern seaboards, the Midwest, and the Great Lakes areas. The Intracoastal Waterway within Louisiana extends along the coast of the Gulf of Mexico from Lake Borgne Light No. 29, the eastern boundary, to the Sabine River, the western boundary, a distance of 302 miles; from Port Allen to Morgan City, a distance of 64 miles; from Plaquemine to Indian Village, a distance of 7.4 miles; and to the town of Franklin via the Franklin Canal, a distance of 5.15 miles. The main route provides for a 12-foot by 150-foot channel from Lake Borgne Light No. 29 to the Industrial Canal, and a 12-foot by 125-foot channel from the Mississippi River to the Sabine River, including the routes through both Algiers and Harvey Lock. Average annual traffic through Algiers Lock, 1969-1973, was 20.7 million tons (U.S. Army Corps of Engineers, 1975: 143-147).

The Houma Navigation Canal allows navigation from the Gulf Intracoastal Waterway near the western edge of Houma to the Gulf of Mexico. Federal maintenance of this canal, completed by non-Federal interests in 1962, was officially assumed in 1962. The oil industry contributes the major cargo on this 15-foot by 150-foot channel (U.S. Army Corps of Engineers, 1975: 105).

The Barataria Bay Waterway extends from the Gulf Intracoastal Waterway in Jefferson Parish to Grand Isle, then along the western shore of Barataria Bay to the 12-foot depth contour in the Gulf of Mexico. Traffic on the waterway consists mainly of oil industry cargo and liquid sulphur. Opportunities for recreational boating and fishing are plentiful throughout the area. The waterway and adjacent waters below Lafitte are used extensively by commercial fishermen and oystermen. The present project, which was last modified in 1967, provides for a channel approximately 37 miles long with a 12-foot depth and 125-foot width from its beginning at the Gulf Intracoastal Waterway to Grand Isle (U.S. Army Corps of Engineers, 1975: 101).

The channels of Bayous LaLoutre, St. Malo, and Yscloskey are presently used mainly by commercial trappers and fishermen en route to Lake Borgne, Chandeleur Sound, and intervening waterways and marsh areas. This 30-mile project has been used by oil companies as a safe, inland route for transporting crude oil, equipment and personnel. The project provides for a 5-foot by 40-foot channel from deep water in Lake Borgne to the shoreline at the mouth of Bayou Yscloskey; a 6- by 40-foot channel from deep water in Lake Borgne through Bayous St. Malo, LaLoutre, and Eloi, to deep water in Lake Eloi; and a 5- by 30-foot channel in Bayou LaLoutre between Hopedale and Bayou St. Malo (U.S. Army Corps of Engineers, 1975: 104).

The major cargo on Bayou Lacombe is gravel from the upper reaches of the bayou. The waterway is heavily used for boating, fishing, and access to Lake Pontchartrain. Completed in 1938, the project consists of a 60-foot wide, 8-foot deep channel through the entrance bar in Lake Pontchartrain and removal of snags and overhanging trees from Mile 8.2 to the mouth of Bayou Lacombe (U.S. Army Corps of Engineers, 1975: 88).

The oil industry provides the major cargo on the Bayou Dupre Waterway, although it is used heavily by recreational craft moving between Violet and Lake Borgne. The project, completed in 1939, includes a 6-foot deep channel from the highway bridge at Violet to deep water in Lake Borgne, with widths of 80 feet in the canal and bayou and 100 feet in the lake (U.S. Army Corps of Engineers, 1975: 101-102).

The Tchefuncte River and Bogue Falaya Waterway, which is approximately 14 miles in length, provides excellent fishing, boating and other recreational opportunities. Adjacent higher land are rapidly being developed for private homes. The original 8-foot project from Covington to Lake Pontchartrain was completed in 1929. The present project provides for a 10-foot by 125-foot navigation channel from a 10-foot depth in Lake Pontchartrain to about Mile 3.5 of the Tchefuncte River. From Mile 3.5 to Washington Street in Covington, the channel would remain 8 feet deep. The present project was completed in 1959 (U.S. Army Corps of Engineers, 1975: 88).

Major traffic on Bayou Bonfuca is generated by a shipyard, a creosote treatment plant, and a clamshell storage area. Completed in 1931, this project consists of an 8-mile long channel, which is 10 feet deep, with a bottom width of 60 feet. The waterway extends from Slidell to deep water in Lake Pontchartrain (U.S. Army Corps of Engineers, 1975: 88).

Commercial traffic on the Pearl River Waterway, a 58-mile navigation channel from the mouth of West Pearl River at the Rigolets to the mouth of Bogue Lusa Creek at Bogalusa, has decreased considerably in recent years. The waterway is now used largely for hunting, fishing, boating, swimming and camping. About 338,000 people visited this canal in 1973. Features of the waterway, which was completed in 1953, include a dredged channel 7-feet deep and 100-feet wide in the West Pearl River from its mouth to Holmes Bayou; a lateral canal 7-feet deep and 80-feet wide from the mouth of Holmes Bayou to Pools Bluff, with three locks having clear inside dimensions of 65-feet wide and 310-feet long and a depth of 10 feet over the sills at low water; and a dredged channel 7-feet deep and 100-feet wide in the Pearl River from Pools Bluff to the mouth of Bogue Lusa Creek (U.S. Army Corps of Engineers, 1975: 83-84).

Another user activity which has similar environmental effects as the construction of major navigation canals is the complex network of oil and gas pipelines which crisscross the four parishes in the New Orleans area. These pipelines each have canals attending them. There are approximately 47 pipelines (Mumphrey, et al., 1975: 85) in the region which carry oil and natural gas from offshore and land drilling sites to refineries, and eventually to consumers both within the area and throughout the northern and eastern portions of the United States.

These pipeline canals tend to increase the rate of runoff and the volume of tidal exchange in the marsh through which they pass. The result is increased salinity which causes faunal and floral changes and acceralated soil erosion

(Mumphrey, et al., 1975: 82-93). Wave action and slump may cause the canals to widen over a period of time. The Southern Natural Gas Pipeline in St. Bernard, for example, was designed origianlly to be 35 feet wide. Since it was built in 1955 the canal has expanded to 100 feet in 1975. Such widening effect may be expected in any channel opened in marshland where new drainage flow patterns must be accommodated (Coastal Environments, Inc., 1972: 95). Permanent environmental stress also results from dredge and fill operations and the construction of refining and petrochemical complexes.

Water Quality and Wastewater Treatment

In this section, the problems affecting water quality in the area are considered. To begin, the amount of water that is required for use is noted; methods used for handling and treating wastewater, both industrial and municipal, are described; and the lack of centralization among state agencies having responsibility for various aspects of water pollution control is discussed. Also discussed are two water-related problems, air pollution and the disposal of solid wastes.

Water pollution is a contributor to estuarine loss. No wetlands are directly destroyed by pollution. Within polluted waters, however, there is massive interference with the essential cycle of life in the ecosystem. This results in deterioration of natural processes and eventually loss of wetlands (Mumphrey et al., 1975: 41).

Water Supply

Approximately 1.4 billion gallons of water per day are withdrawn from ground and surface sources to use in the New Orleans SMSA for municipal, rural, domestic, industrial and thermo-electric purposes. 1970 water usage by parish is shown in Table 2.15. Withdrawals from surface sources accounted for 95.3 percent of the usage and the remaining 4.7 percent is withdrawn from underground sources. The Mississippi River is the principal water supply source. Despite its huge flow, quality problems due to municipal and industrial pollutants and salt water intrusion have raised questions as to the continuing viability of the River as a sole water supply source (U.S. Army Corps of Engineers, 1974: 26).

Wastewater Treatment

Wastewater handling and disposal have resulted in serious water quality problems in the New Orleans SMSA. Acting in accordance with procedures of the Environmental Protection Agency (EPA), the state of Louisiana has declared Lakes Pontchartrain and Borgne, the Mississippi River, the Gulf Intracoastal Waterway, and the Mississippi River-Gulf Outlet to be water quality limited.[2] At present, efforts to improve water quality are being directed towards complying with EPA

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[2]Bodies judged to be water qualtiy limited do not meet the state's water quality criteria as to aesthetics, color, floating, suspended and settleable solids, taste and odor, toxic substances, oils and greases, foaming or frothing materials, nutrients, turbidity, and other materials (Louisiana Stream Commission, 1973: 10-12).

TABLE 2.15

EXISTING WATER USE
RATE OF WITHDRAWAL - MGD

Parish	Public and Rural Domestic Supply Ground	Public and Rural Domestic Supply Surface	Agriculture Ground	Agriculture Surface	Thermoelectric and Industrial Ground	Thermoelectric and Industrial Surface	Total Ground	Total Surface
Ascension	1.16	0.73	0.51	0.01	3.35	108.53	5.02	109.27
Assumption	0	0.62	0	0.02	4.92	20.72	4.92	21.36
East Baton Rouge	32.75	0	0.63	0.33	107.07	370.16	140.45	370.49
East Feliciana	0.84	0	0.02	0.37	1.55	0	2.41	0.37
Iberville	0.87	0	0.07	0.13	12.79	1097.11	13.73	1097.24
Jefferson	0	39.3	0.19	0.01	10.23	314.07	10.42	353.38
Lafourche	0	5.2	0.06	0.25	0	22.23	0.06	27.68
Livingston	5.12	0	1.18	0.08	1.21	0	7.51	0.08
Orleans	0.01	127.37	0.07	0.02	43.09	241.78	43.17	369.17
Pointe Coupee	1.02	0	1.24	0.51	2.27	0	4.53	0.51
Plaquemines	0	3.58	0	0.05	0	23.84	0	27.47
St. Bernard	0	6.09	0	0	1.63	590.50	1.63	596.59
St. Charles	0	2.95	0.03	0.03	14.07	1694.46	14.10	1697.44
St. Helena	0.37	0	0.02	0.74	0	0	0.39	0.74
St. James	0	0.99	0.08	0.46	5.36	220.00	5.44	221.45
St. John	0.07	1.35	0.08	0.01	5.25	53.73	5.40	55.09
St. Tammany	5.08	0	0.30	0.34	3.64	0.08	9.02	0.42
Tangipahoa	12.75	0	2.71	0.71	1.61	0	17.07	0.71
West Baton Rouge	2.46	0	0.25	0.02	7.64	0	10.35	0.02
West Feliciana	0.55	0	0.03	0.24	6.35	32.00	6.93	32.24
Total	63.05	188.18	7.47	4.33	232.03	4789.21	302.55	4981.72

Source: U.S. Army Corps of Engineers, 1974: 27.

requirements for the year 1977. An example of such efforts is the $28 million secondary sewage treatment plant currently under construction in Orleans Parish. It is expected that these water bodies will remain water quality limited even after the 1977 goal is achieved (U.S. Army Corps of Engineers, 1974: 19).

In general, water quality problems which originate in the area result from inadequate treatment of municipal and industrial wastes, from cooling water discharges, and from water used in petroleum production and water borne transportation. There are also non-point sources of pollution, such as urban and rural runoff. Congress is now considering ways of strengthening section 208 of the 1972 Water Pollution Act (U.S. Congress, 1972) to provide more effective enforcement of measures to prevent non-point discharges, both agricultural and homeowners' pollution (Clement, D., 1976).

Municipal and industrial sewage treatment facilities within the SMSA generally provide less than secondary treatment. Of the 72 known industrial dischargers in the area, the majority of them provide only primary or inadequate secondary treatment (Louisiana Stream Control Commission, 1976). Some industrial discharges have been found to contain heavy metals, lead, mercury, zinc, as well as phenols, cyanides and many organic compounds. Wastes generated by ships and other marine craft also present a pollution problem. Oil spills present a major problem. Oil spilled in estuaries and marshlands is more likely to be trapped and incorporated into sediment where it can persist for long periods (Mumphrey et al., 1976: 182-191). All types of oranisms absorb the pollutants carried by the river water as it filters through the coastal bays and marshes of the coastline (Mumphrey et al., 1975: 59). Since industrial development is important to the region's economy, a harmonious balancing of the demands they impose upon the water resources must be achieved (U.S. Army Corps of Engineers, 1974: 20).

Most municipal areas in the region have developed waste sewage treatment facilities, using EPA funds which are readily available. Most major areas have become regionalized, with one large control plant using a high level of treatment. The West Bank of Jefferson Parish is the largest area not to develop a centralized waste sewerage treatment plant, relying instead on local treatment plants (Bruce, 1976).

However, there are still municipal swage treatment facilities that provide less than secondary treatment. High coliform counts, primarily resulting from inadequately treated wastes, periodically render portions of Lakes Pontchartrain and Borgne unsuitable for recreation or shell fish production.

Water Pollution Control Efforts

The state's overall pollution control effort is segmented, with various agencies having responsibilities for specific aspects of pollution control. With respect to water pollution, the Stream Control Commission has primary responsibility, especially as it relates to emissions from industrial sources.

Several other agencies share the total responsibility. The Department of Conservation has jurisdiction over water pollution that is caused by oil operations; the Soil and Water Conservation Committee aids in controlling water pollution that is caused by runoffs from agricultural lands; the Environmental Health Bureau of the Division of Health has jurisdiction over water pollution that has health implications (e.g., municipal sewage treatment plants); the Department of Public Works has jurisdiction over all water resources development projects within the state; and the Pollution Enforcement Section of the Enforcement Division of the Wildlife and Fisheries Commission enforces pollution laws and regulations. The responsibility of these agencies is mainly limited to enforcement, regulation, and management. Construction and operation of water pollution control facilities is normally handled at the parish or municipal level by semi-autonomous sewer and water boards, whose members are appointed by the local elected officials (U.S. Army Corps of Engineers, 1974: 15-16).

Air Pollution and Solid Waste

Significant environmental problems derive from air pollution and the accumulation and disposal of solid wastes. The major air pollution sources are found in or adjacent to the urban communities. Air pollution in the rural areas is usually minor and localized, being limited to the burning of sugar cane fields or occasional forest fires. In addition to the automobile, other major air pollution sources include the petrochemical industries, paper mills, grain elevators, and industries which burn fuels other than natural gas. The New Orleans SMSA is classified priority I with respect to sulphur dioxide and hydrocarbons, which indicates that a significant health hazard exists with respect to these pollutants. The area is also classified priority III with respect to carbon monoxide and nitrogen dioxide, which indicates significant pollution exists and could be detrimental to vegetation and exposed surfaces, as well as being a health hazzard (U.S. Army Corps of Engineers, 1974: 18).

Solid waste disposal is a growing environmental problem. The solid waste handled publicly is estimated to average five pounds per capita per day in the New Orleans area. Presently, incineration and open dumping are widely used methods of solid waste disposal in the area (U.S. Army Corps of Engineers, 1974: 19). The City of New Orleans historically has used the land-fill method for disposing of some of its garbage. While land fills avoid the increased air pollution that would result from burning the garbage, they create water pollution. Decaying garbage breeds large quantities of coliform and salmonella bacteria. During heavy rainfalls, this highly polluted water is washed into Bayou Bienvenue and then into Lake Borgne. Off and on for many years, the oyster beds in Lake Borgne have had to be closed to harvesting due to abnormally high bacterial counts stemming from the runoff associated with the large land fills on Paris Road in St. Bernard Parish and eastern New Orleans (Mumphrey et al., 1975: 57).

Beginning in the summer of 1976, New Orleans adopted an alternative to nonproductive landfilling and incineration. The new method diverts solid waste from disposal to re-use. Known as Recovery I, the facility recovers and prepares for re-use, by industry, such materials as paper, ferrous metals, aluminum and glass (see Table 2.16). The residue, mostly light, organic material, will be used to fill in land in eastern New Orleans. This new method of solid waste disposal will result in less pollution, while conserving natural resources and providing a more sanitary landfill method (Parker, 1976: 8-12).

CURRENT COASTAL ZONE MANAGEMENT EFFORTS

None of the four parishes in the New Orleans SMSA has a coastal zone management plan that has been adopted by local government officials, thus carrying legal sanctions. Instead, parish officials rely on their zoning ordinances and building codes as tools by which to manage their coastal zone. The parishes are at different stages in developing CZM plans, but each parish intends to develop its own plan. The New Orleans City Planning Commission has written a three-volume CZM Plan (1975) which is now being considered for adoption by the City Planning Commission and the New Orleans City Council. Rulings by the two bodies are expected shortly. The St.

TABLE 2.16

New Orleans Recovery Facility

Material Recovery Estimates

Product	Tons/Day Available in Waste Stream	Tons/Day Recovered	Recovery Rate (%)
Glass	72	47.0	65
Ferrous Materials	49	46.0	93
Aluminum	6	3.6	60
Other Nonferrous Materials	3	1.2	40
Newspaper	65	20.0	31

Source: Parker, 1976: 12.

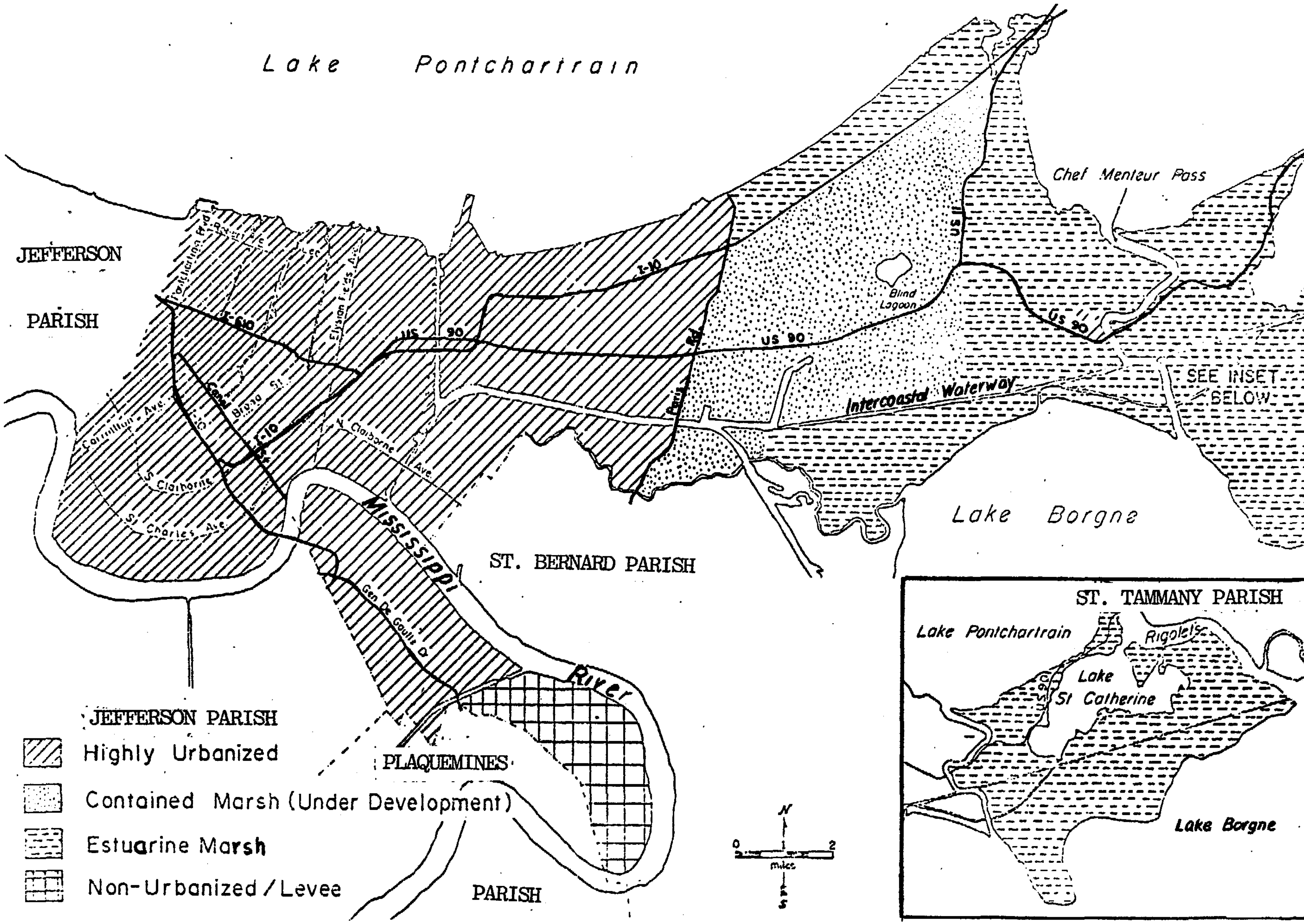
Bernard Parish Planning Commission is in the process of writing a CZM Plan, having already received studies of the parish's environmental baseline (Coastal Environments, Inc., 1972) and resource management of the parish's wetlands (Coastal Environments, Inc., 1976, draft). The Jefferson Parish Planning Department decided this spring that they would participate, using state monies, in the development of a CZM Plan. Jefferson Parish has completed an inventory of its land use and natural features (Burk and Associates, Inc. and Earth Satellite Corporation, 1974). The St. Tammany Parish Planning Department received authority this spring from the Police Jury to begin developing a CZM Plan, using state monies. At that time, planning became a department separate from the engineering department (Sinden, 1976).

New Orleans

The CZM Plan (City Planning Commission of New Orleans, 1975: 25-33) has identified four environmental areas within the City of New Orleans (see Figure 2.13). These are: 1) the highly urbanized area, which includes the most heavily populated areas of the city; 2) the contained marsh area, consisting of impounded fresh water marsh now being sporadically drained, is bounded by Paris Road on the west, I-10 on the north, the Gulf Intracoastal on the south, and U.S. Highway 11 on the east; 3) the nonurbanized/levee area, which encompasses all of the Lower Coast of Algiers, and is either

FIGURE 2.13

ENVIRONMENTAL AREAS



Source: New Orleans City Planning Commission, 1975: 32.

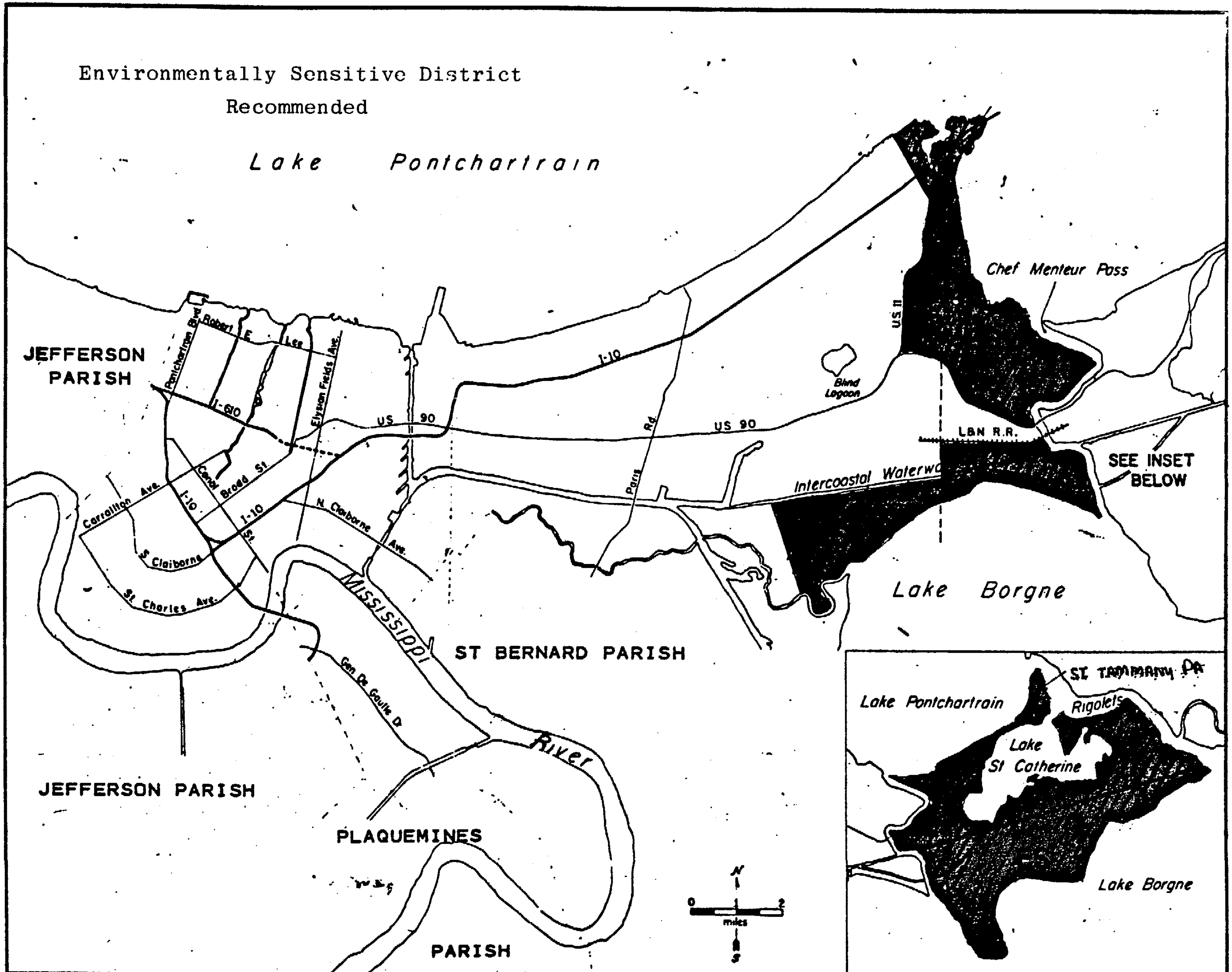
forested or under agricultural use; and 4) the estuarine marsh area, a viable part of the Maurepas-Pontchartrain-Borgne estuary complex, contains land in the Irish Bayou-Chef Menteur Marsh Unit, Lake Borgne Unit, Venetian Isles Marsh Unit, Chef Menteur/Rigolets Unit, and Lakefront Unit. Within the estuarine marsh area are several units characterized as critical areas: the Irish Bayou-Chef Menteur Marsh Unit, the Lake Borgne Unit, the Southern Venetian Isles, as well as one area on the Lower Coast of Algiers (see Figure 2.14). These areas are designated critical because they lie in the path of probable future development,

> but at the same time, are areas which provide a substantial habitat for fish, waterfowl, and other species of wildlife which contribute to the region's resources in terms of seafood production and recreational pursuit; therefore, development in these areas should be prohibited (City Planning Commission of New Orleans, 1975: 30).

Protecting these critical areas may involve the introduction and adoption of measures whose primary purpose is wetlands preservation. Such measures would be introduced after detailed environmental studies, including a management study of the physical environment, have been completed.

The legal devices presently used by the City of New Orleans in the coastal zone do not provide any remedy for the problems peculiar to wetlands areas. The Planning Commission thinks that the city can begin to manage the estuarine areas, however, by amending the existing Municipal Code, Building Code and the Comprehensive Zoning Ordinance (City Planning Commission of New Orleans, 1975: 53). Presently, Chapter 32

FIGURE 2.14



Environmentally Sensitive District Recommended

Source: New Orleans City Planning Commission 1975: 79.

of the Municipal Code authorizes the city to regulate land uses. A recent amendment to the code is the "Flood Insurance Ordinance" which regulates development in flood prone areas. The ordinance requires that the lowest floor of new construction or substantial improvements of existing structures must be elevated at or above the level of the 100-year flood (City Planning Commission of New Orleans, 1975: 56).

The Comprehensive Zoning Ordinance of 1970 (City Planning Commission of New Orleans, 1970) divides the city into nine different kinds of districts. The regulations for each district have been designed so as to reflect its peculiar character and its suitability for particular uses. For example, uses in the Vieux Carre Districts must not injure the historical character or be out of harmony with the traditional architectural character of the Vieux Carre (City Planning Commission of New Orleans, 1970: 10-11). The ordinance regulates the location and use of buildings, signs and other structures, water and land for agriculture, trade, industry and residence, the area of yards and other open spaces, and the density of use.

The City Planning Commission would like for the City Council to enact a CZM Plan which provides for "controlled development--with management" (City Planning Commission of New Orleans, 1975: 65). This plan would place controls on land use and development densities in areas designated as environmentally sensitive. It would also provide for the development of an overt action plan designed to maintain and enhance natural resources.

As part of its study which produced the proposed CZM Plan, the City Planning Commission identified the major natural resources of the area and the problems which threaten to limit or destroy these resources. The Commission defined nine problem areas and presented remedial action for each one (City Planning Commission of New Orleans, 1975: 2-10). One of the problems is pollution of the water in Lake Pontchartrain caused by fishing camps which lack proper sewage disposal systems, storm water discharges from urban drainage systems, and direct sewage from boats. Recommendations for easing lake pollution include multi-stage removal of fishing camps, except those that are located along and in the wetlands adjacent to U.S. Highway 11 and 90; adoption by the state of strenuous regulations and a program to preclude biological pollutants from entering the lake, with local governments responsible for compliance.

The second problem area is pollution of the Mississippi River from municipal, industrial, and agricultural discharges. To combat river pollution, the Commission recommends vigorous enforcement of the regulations of the Federal Water Pollution Control Act (U.S. Congress, 1972), funding from the Environmental Protection Agency to local parishes to construct secondary sewage treatment facilities, and a program to provide for an additional water intake system further up the Mississippi River, since the present system is threatened with salt water intrusion.

Flooding presents a problem for areas exterior and interior to the present levee system. To prevent flooding within interior areas, the Commission recommends that all existing floodable pumping stations be renovated so as to raise electrical components above projected flood levels and all levees protecting the city be elevated to project height and adequately maintained. It recommends that the flood protection system be improved to a project storm level of 200 years. It also recommends that construction of the Lake Pontchartrain and Vicinity Hurricane Protection Plan control structures should proceed, provided that a 90 percent tidal interchange can be maintained in the affected passes.

The fourth problem area is wetland development pressures, including expansion of urban development, expansion of fishing camp developments, and mineral exploration activities. To lessen this problem, the Commission recommends that undeveloped and unleveed wetland areas currently subject to severe development pressures be brought immediately into public ownership and preserved; where possible, these areas should be developed as limited recreational sites. Those wetlands not acquired should be subject to strict regulations, including not developing more than five percent of a tract or lot area.

Because the coastal area is in a tectonically active region, faults present a problem and the state should determine the significance of these fault lines.

The sixth problem area is the presence of poor soils in much of the city, which tend to subside when drained and require periodic refilling of lots. The Commission recommends that the Department of Safety and Permits institute a study of alternative construction techniques to determine the most feasible one to be used in reclaimed wetlands areas and the Sewerage and Water Board study alternative drainage methods to use in leveed, but undeveloped, areas.

Loss or damage to the parish's numerous archaeological sites presents a problem that can be combatted by having the state conduct a survey of the entire city to determine the location of major preservable sites and adopting legislation to ensure the protection and acquisition of major sites and the recovery of artifacts from other sites.

Rapid shoreline erosion along Lakes Pontchartrain and Borgne presents a problem because it destroys productive wetland and reduces land area dimensions. The Commission recommends that barrier islands be constructed by the Corps of Engineers and the Orleans Levee Board to prevent rapid shoreline erosion. It also recommends that the state study the feasibility of diverting water from the Mississippi River in order to restore eroding marsh areas in Orleans Parish.

The last major problem cited by the Commission is the lack of statewide coastal zone management legislation and coordination. The Commission outlines 14 areas which should be encompassed by a state coastal zone management plan, including a provision that local governments be authorized to enact and enforce local CZM plans, using state guidelines and supervision, provided the local acts are consistent with the objectives of a state CZM plan. The Commission recommends that local governments establish coordinating councils composed of government officials and representatives of appropriate academic disciplines.

Randolph Clement (1976) said the impetus for CZM in Orleans Parish came from a variety of reasons. For one, the Planning Commission feared Federal intervention if they did not take the initiative and come up with a plan of their own; they acted therefore, to maintain local autonomy. For another, they feared the city could not afford to provide services to the area between Chef Menteur and Rigolets if it became developed. They peferred using this area for recreational hunting and fishing.

In order to implement a CZM plan most efficiently, Randolph Clement (1976) said that the City Planning Commission considers its main priority to be getting the city to acquire those wetlands which are outside its present levee system (i.e., areas designated as environmentally sensitive). He thinks it is a choice of either purchasing the rights to the wetlands and bringing them into the pbulic domain (see City Planning Commission of New Orleans, 1975: 6) at a price of about $15 - $20 million, or allowing the land to develop. If the land develops, the city would have to provide it with sewerage and water and he feels that would be less cost effective than purchasing the land. If the wetlands are acquired, they could be used for water trails and access to natural beaches. The land between Chef Menteur and Riolets could be developed into a park around Blind Lagoon.

Randolph Clement (1976) said the Commission has the authority to adopt a land use plan, although the New Orleans City Council has the power to override the plan if it chooses to do so. The Commission can also write its own subdivision regulations. It does not have its own capital budget, however, so it cannot purchase property. Clement said it is allocated funds by the City Council only through another agency. The Commission could not purchase, therefore, the wetland areas and bring them into the public domain; it can only recommend that the areas be purchased. It is the City Council only that can amend the building code or the comprehensive zoning ordinance, as the Commission has recommended they be amended in the CZM Plan.

As presently constituted, the Commission has no enforcement role. The Department of Safety and Permits is now charged with enforcing regulations. Randolph Clement (1976) said he assumes that under a CZM Plan, the Department of Safety and Permits would become the managerial agency responsible for enforcement.

Randolph Clement (1976) also said that until a CZM plan is adopted, the Commission cannot know if it has adequate personnel. More professional personnel may be needed, he said, to conduct the environmental studies that would enable the Commission to refine and further amend, if necessary, the legal mechanisms by which to manage the coastal zone.

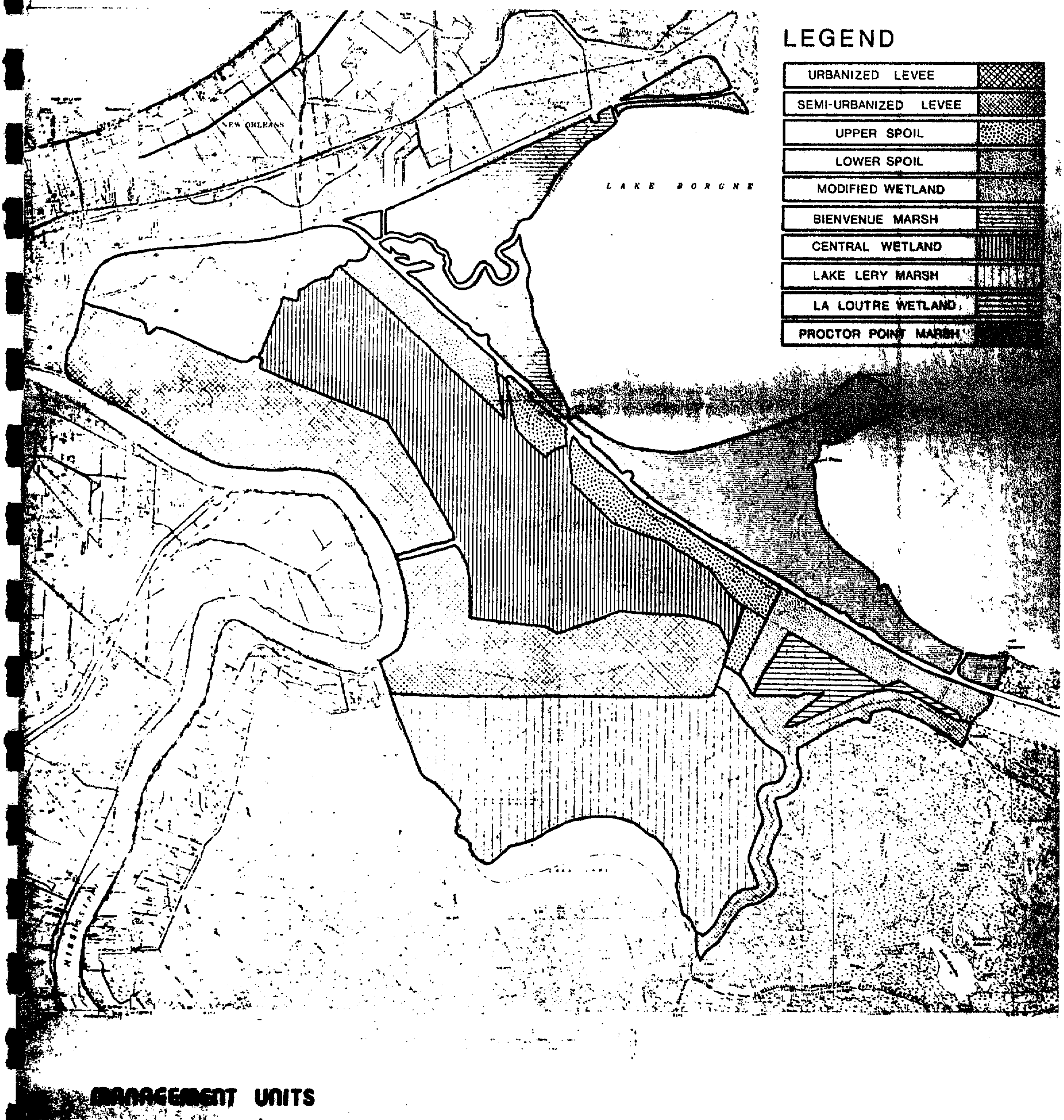
St. Bernard

A recent study (Environmental Baseline Study) divided the parish into ten management units and recommended a management policy suited to each unit (Coastal Environments, Inc., 1972: 124-147). The units include: 1) urbanized levee--20,650 acres occupying the major levee areas along the Mississippi River and Bayou Terre aux Boeufs; 2) semi-urbanized levee--4100 acres posited on a natural levee along Bayou Terre aux Boeufs and Lake Loutre; 3) modified wetland--about 6675 acres west of Paris Road and extending to the back protection levee and the Intracoastal Waterway; 4) coastal wetland--18,250 acres between the urbanized levee area and the spoil bank of the Mississippi River-Gulf Outlet (MRGO).

The other units are 5) upper spoil--5000 acres lying along the MRGO canal, enclosed by a protection levee; 6) Bienvenue marsh--7700 acres at the intersection of MRGO and the Intracoastal Waterway, bounded on the east by Lake Borgne with Bayou Bienvenue flowing through its center; 7) Proctor Point Marsh--10,600 acres located west of MRGO and forming an edge of a lobe of Lake Borgne; 8) Lake Lery Marsh--16,400 acres located between Lake Lery on the south and the levee unit of Terre aux Boeufs on the north; 9) lower spoil unit--24,000 acres located along the MRGO in an area between Proctor Point Marsh and Bayou LaLoutre; and 10) LaLoutre Wetland--1950 acres between the lower spoil unit and the semi-urbanized levee unit, which is almost entirely enclosed by them with only limited drainage connection to the MRGO (see Figure 2.15).

FIGURE 2.15

MANAGEMENT UNITS, ST. BERNARD



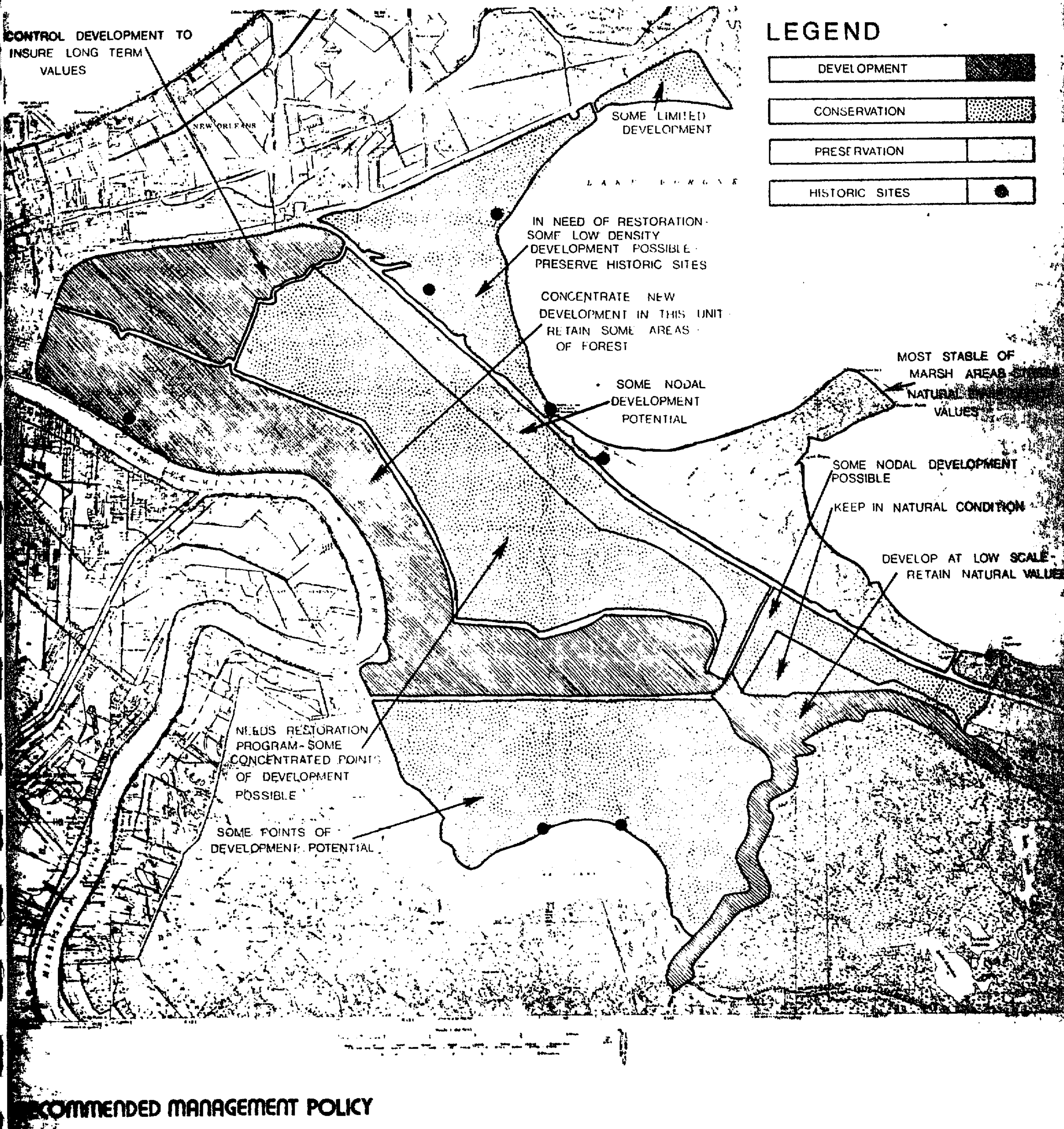
Source: Coastal Environments, Inc., 1972: Plate 14.

The recommended policies for these management units include development with some conservation control for the urbanized levee unit and the semi-urbanized levee unit. Because of its location, some degree of urban use is recommended for the modified wetland unit, but only if adequate flood protection and drainage are provided. Its area around Chef Menteur Pass should be managed for conservation. The upper spoil unit should be managed for conservation. Bienvenue Marsh and Proctor Point Marsh are of direct value to people of the parish for commercial fishing and as sports recreation zone. However, because the areas have been highly modified by pipeline canals, drainage canals, and Bienvenue Marsh by two major waterways, the recommended policy is for conservation only, rather than preservation. Proctor Point has been least modified, but its edge along the MRGO is in considerable danger of deterioration as a result of daily erosion generated by ship waves. Therefore, this area should be managed for preservation, which means that no permanent structures, urban services, or canals are allowed. The lower spoil unit is recommended as a conservation area, but allowing fairly concentrated development in places built high by dredge spoil deposition. LaLoutre Wetland is also recommended for conservation, along with a program of restoration to re-establish the marsh-swamp relationship (see Figure 2.16).

St. Bernard has major significance as both a valuable estuarine parish and as an area of rapid urban growth. The

FIGURE 2.16

Policies for Management Units, St. Bernard



Source: Coastal Environments, Inc., 1972: Plate 15.

Planning Commission has recognized the need for balanced growth within the parish and has been interested in developing ways of managing the coastal zone since 1972. Since that time, they have commissioned the environmental baseline study (1972) and a resource management study of the parish wetlands (1976, draft). They expect to have a CZM plan completed within the next year. They would like the plan to provide for dividing the entire parish into management zones, including zoning of the wetlands, and making recommendations for each zone as far as conservation, restoration, and maintenance are concerned (Chetta, 1976).

Until a CZM plan is completed and approved by the parish police jury, St. Bernard has to rely on its present legal devices for managing the area. These include the comprehensive zoning ordinance (St. Bernard Planning Commission, 1971), which recognizes that the parish will be a low-density community. The parish is divided into eight districts, including single-, two-, and multiple-family residential districts, neighborhood and general commercial districts, light and heavy industrial districts, and rural districts. The wetlands are zoned A-1 rural and all uses--residential, commercial and industrial--are permitted. Before a building or structure can be altered or erected in one of these districts, a permit, in accordance with the requirements of the Parish Engineer, must be issued by the Zoning Administrator. The building permit is issued only after the Zoning Administrator is satified that the proposed use of the building or land complies with the provisions of the Comprehensive Zoning Ordinance (St. Bernard Planning Commission, 1971: 45). The Commission has written a subdivision plan for the parish, but it has yet to be adopted by the police jury (Chetta, 1976).

The Planning Commission would like to see a coastal zone management plan enacted as soon as possible because if St. Bernard Parish development goes beyond its present boundaries, there will be too much linear area for the adequate provision of public services. The parish would not be able to provide the kind of fire and police protection the residents demand, and other services would suffer, too. Chetta does not think land developers will be against a CZM plan because they know how expensive it is to build in the marshy areas which require pilings and flood insurance, among other things.

In order to implement a CZM plan, Chetta thinks that the parish would need to get supplemental funds from the state to be used for refining their plan so as to bring it into line with the federal Coastal Zone Management Act of 1972 (U.S. Congress, 1972). To date, the parish has financed its own coastal zone management studies. The parish would also need money with which to create new regulations for building permits. He also thinks they would need additional staff to enforce the plan. He said the police jury would continue to have the authority to enforce the plan. At present, the planning commission is an advisory body only, with the police jury having all of the authority.

He thinks the police jury may create a department or agency to implement the plan. He was uncertain whether this would lead to an increase in the amount of delegated authority his commission might receive.

Chetta said the commission would also like to receive money to be used for public hearings so they can invite public participation. There has been no public participation to date. As soon as the commission gets the outlines of a plan written, he thinks public input would be helpful. He does not expect much opposition to a CZM plan from most residents, since many of them make their living from the fishing and trapping industries and they would not want the coastal zone to diminish (Chetta, 1976).

The impetus for creating a CZM plan, Chetta said, was the controversy surrounding the Violet Shiplock Canal, which would have connected the Mississippi River with the Mississippi River-Gulf Outlet. The parish's priorities were to mitigate the adverse effects of the Mississippi River-Gulf Outlet and to stem erosion of the coast. They realized that to fight the canal, they needed good environmental data about its impacts on the parish and commissioned a study on the effects of an enlarged MRGO on the parish. The study recommended against this since it would destroy almost 80,000 acres of fish and wildlife habitat and oyster bottom, and significantly increase salinity along the MRGO and in adjacent marshes (Coastal Environments, Inc., 1973: 50).

Jefferson Parish

This spring, the Planning Department informed the State Planning Office of its intention to participate this year in the development of a CZM plan. The parish has also asked Burk and Associates, which is under contract to the parish to provide environmental engineering services, to do a preliminary study which would develop criteria for boundary selection, define growth and conservation lines, provide a statement of goals and priorities of coastal uses, and prepare a boundary report (Ford, 1976).

In 1974, the parish completed an inventory of its land use and natural resources (Burk and Associates, Inc. and Earth Satellite Corporation, 1974), and it is expected that this information will form the basis of a CZM plan. A land use plan is expected to be completed by the fall of 1976, and will be used to update the department's planning variables. The parish has no comprehensive plan as far as the development of the parish is concerned (Terranova, 1976).

The present legal devices used to manage the parish's land use include the Comprehensive Zoning Ordinance, the Building Code, and the Subdivision Regulations. The Zoning Ordinance (Jefferson Parish Council, 1974) divides the parish into 12 districts, including suburban districts, residential districts, medical service districts, commercial districts, industrial districts, and an unrestricted district. Within the unrestricted (or, U-1) district, "a building or land may be used for any prupose whatsoever not in conflict with any ordinance" of the parish, including the manufacture of noxious gases and dangerous materials (Jefferson Parish Council, 1974: 70). The unrestricted district is found within the parish's wetlands area.

There can be no change in the use or occupancy in an existing building nor can any new building be occupied for any purpose until a certificate of use or occupancy has been issued by the Safety Director. Every certificate of use or occupancy must show that the new use complies with all the provisions of the zoning ordinance pertaining to the district in which it is located (Jefferson Parish Council, 1974: 101).

The subdivision Regulations (Jefferson Parish Planning Department, 1972) requires that developers identify in their final plan to the Parish Council those lots which lie at such a low elevation that it has been inundated or overflowed by rain or storm waters within the last 20 years (Jefferson Parish Planning Department, 1972: 430-431). The owner or subdivider is also responsible for constructing the necessary facilities for adequate drainage of the area and grading all streets to the specifications established by the parish engineer (Jefferson Parish Planning Department, 1972: 434, 434.1). New homes throughout the parish must be provided with flood protection insurance (Terranova, 1976).

Jefferson Parish would welcome a CZM plan; with such a plan there would be no dispute as to which areas would be reserved for development and which for preservation in their natural habitat (Terranova, 1976). Because the parish is still in the initial stages of developing a CZM plan, it is difficult for them to determine now what their needs will be in furthering CZM for the parish. Ford (1976) thinks that the Parish Council would create a new planning commission to implement a CZM plan. If his planning department is upgraded to a commission and charged with implementation, then he would need more staff to provide administrative assistance. As head of a department, his main function is as advisor to the Parish Council. For instance, as it is now, all subdivision requests are approved directly by the Council.

Ford would also like for the state to provide local officials with guidelines and technical advise so that they would be in a position to develop adequate local CZM plans. What the parishes have lacked most, he said, is enough good information on the coastal zone to allow them to know what to do and how to proceed. He wants the State Planning Office to share its information on a regualr basis with the local officials. He would like to see implementation of a CZM plan handled by the local parishes (Ford, 1976).

St. Tammany

This spring, the police jury gave the planning department the authority to develop a coastal zone management plan, using monies available from the state. The newly-hired planning director is in the process of hiring a staff for his department. He has not yet considered what the broad outlines of a CZM plan for St. Tammany should be, but he favors development of the parish within bounds. He would like to see balanced growth while maintaining a satisfactory density ratio (Sinden, 1976).

Within the past several years, the parish officials, often as a result of pressure from parish environmental groups, have become more aware of the need for legal mechanisms to control the use of land in the area. Many environmentalists and other local residents have become concerned about the many new subdivisions being developed in the parish (Rushton, 1974). They are concerned about the negative impact these subdivisions have on the environment and the inability of parish cities and towns to provide public services to these subdivisions (Sollberger, 1976). As a result of this concern, a parish land use ordinance (St. Tammany Police Jury, 1972) was adopted, which established parish-wide land use regulations. All buildings now have to be at least eight feet above sea level. The parish also has a housing plan, which identifies where there should be a mix of low- and middle-income housing.

The parish does not have a comprehensive zoning code or a building code, but both codes are expected to be developed in 1977 using HUD 701 funds. Developers are supposed to follow FHA guidelines in erecting their structures, but officials do not enforce these guidelines (Sollberger, 1976).

Sinden said his department would like to have the State Planning Office provide them with technical information and assistance in their development of a local CZM plan. He thinks the guidelines for a plan should come from the Regional Planning Commission (RPC) because RPC has had more experience working with the four parishes. He said he has no idea what parish department will be given the authority to enforce a CZM plan.

He expects that developers along Bayou Liberty will not have to be convinced about the need to develop a CZM plan because they have experienced flooding and, therefore, know there is a limit to what can be done in that area. Developers along the eastern side of I-10 will probably be against a CZM plan (Sinden, 1976).

CONCLUSION

The four parishes in the New Orleans Region are at different stages in providing legal mechanisms by which to manage their coastal zones. Existing mechanisms include comprehensive zoning ordinances, building codes and municipal codes. The parishes are also subject to federal regulations which apply to the management of the coastal zone. These federal laws include the Coastal Zone Management Act of 1972 (U.S. Congress, 1972); the Water Pollution Control Act (U.S. Congress, 1972); the National Environmental Protection Act (U.S. Congress, 1969); and the National Historical Preservation Act (U.S. Congress, 1966). Each parish intends to develop its own CZM plan, tailored to its local needs and resources. Orleans Parish has completed a CZM Plan, but it has yet to be adopted by the New Orleans City Council. St. Bernard Parish is in the middle stages of developing a plan. Jefferson and St. Tammany Parishes are in the initial stages of developing CZM plans. Until their CZM plans are developed and adopted by local officials, the chief planners in the parishes are uncertain of what supportive materials and personnel will be needed in furthering a CZM effort.

APPENDIX 2.1

ANNOTATED BIBLIOGRAPHY OF PARISH CZM DOCUMENTS

U.S. Department of Agriculture (1973) Soil Survey of Portions of Jefferson, Orleans, St. Bernard Parishes, Louisiana. Alexandria, Louisiana: U.S. Department of Agriculture.

Discusses factors and processes of soil formation; provides two systems of classifying soils; describes eighteen different types of soils; discusses uses for different types of soil.

__________________ (1974) Soil Survey of Portions of St. Tammany Parish. Alexandria, Louisiana: U.S. Department of Agriculture.

Provides a summary of soil conditions; describes ten different types of soils; discusses uses for different types of soil; describes plant adaptations to the different soils.

Expansion into Low-Lying Areas

Streets

Jefferson Parish Council (1973) Jefferson Parish Major Street Map. Jefferson Parish, Louisiana: Jefferson Parish Council.

Shows present and projected major streets for the parish. Projected streets are not dated. Minor streets within subdivisions are the responsibility of developers.

The street map is the result of two earlier studies: Palmer and Baker Engineers, Inc. (1957) Street Inventory, Parish of Jefferson, Louisiana. Metairie, Louisiana: Palmer and Baker Engineering; and Palmer and Baker Engineers, Inc. (1958) Street Capacity and Congestion, Jefferson. Metairie, Louisiana: Palmer and Baker Engineers, Inc.

Louisiana Department of Highways (1964) Louisiana Highways, Present and Future. Baton Rouge, Louisiana: Louisiana Department of Highways.

Presents the master plan for the construction of highways in the state.

New Orleans City Planning Commission (1974) Major Street Map for New Orleans. New Orleans, Louisiana: City Planning Commission.

Presents location of present and proposed streets in the City of New Orleans.

Planning Services, Inc. (1963) Major Thoroughfare Plan. New Orleans, Louisiana: Planning Services, Inc.

Provides the basis and rationale for the present Street Map, showing location of present and proposed streets in St. Bernard Parish: St. Bernard Parish Planning Commission (1972) Major Street Map. Chalmette, Louisiana: St. Bernard Parish Planning Commission.

St. Tammany Parish Planning Commission (1962) Major Street Plan: St. Tammany Parish. Covington, Louisiana: St. Tammany Planning Commission.

Presents location of present and proposed major streets in St. Tammany Parish.

Drainage

City Planning Commission of New Orleans (1976) Capital Program, 1977-1981. New Orleans, Louisiana: City Planning Commission.

Each year the capital program is updated for the next five years, outlining the plans for new drainage facilities needed to handle the drainage problem in the city. Accompanying the report is a map showing the location of proposed new facilities.

Maps showing the existing drainage systems are on file with the Engineering Division of the Sewerage and Water Board and are updated periodically.

Community Planners, Inc. (1973) Utility and Drainage Study for Slidell, Louisiana: Final Report. Baton Rouge, Louisiana: Community Planners, Inc.

Presents a description of present utility and drainage facilities and makes recommendations for new facilities based on the future needs of the community.

Fromherz Engineers, Inc. (1968) Master Plan for Major Drainage Facilities, Consolidated Sewerage District No. 1 of Jefferson Parish, Louisiana. New Orleans, Louisiana: Fromherz Engineers, Inc.

__________ (1969) Master Plan for Major Drainage Facilities, Drainage District No. 7 of Jefferson Parish, Louisiana. New Orleans, Louisiana: Fromherz Engineers, Inc.

The two studies provide descriptions of present drainage facilities in the two districts and recommend new facilities to handle the projected population growth.

Jefferson Parish Council (1973) Master Water and Drainage Plan for the West Bank. Jefferson Parish, Louisiana: Jefferson Parish Council.

Plans do not call for any drainage beyond existing leveed areas.

An earlier study by Palmer and Baker Engineers, Inc. (n.d.) suggested that land subject to flooding not be used for residential purposes (Recommended Regulations for Land Subdivisions).

The present subdivision regulations, section 18-11c, state that subdevelopers must supply drainage to their developments, specifications for which must be approved by the parish engineer. See Jefferson Parish Planning Department (1972) Jefferson Parish Subdivision Regulations: Ordinance No. 959. Jefferson Parish, Louisiana: Jefferson Parish Planning Department.

A master water plan for the West Bank was done earlier: Burk and Associates, Inc. (1966) A Master Water Plan for the West Bank Consolidated Water District of Jefferson Parish, Louisiana: New Orleans, Louisiana: Burk and Associates, Inc.

Sewerage

Burk and Associates, Inc. (1972) Partial Interim Water Quality Management Plan for Sewerage District No. 2, City of Kenner, Louisiana. New Orleans, Louisiana: Burk and Associates, Inc.

Roessle and Cartier (1972) Partial Interim Water Quality Management Plan for Sewerage District No. 1, City of Kenner, Louisiana. Kenner, Louisiana. Roessle and Cartier, Inc.

These studies provide the basis for a consideration of alternatives for improving the disposal and treatment of sewerage in the City of Kenner.

________________ (1973) Interim Water Quality Management Plan for Sewerage District No. 1, St. Bernard Parish, Louisiana. New Orleans, Louisiana: Burk and Associates, Inc.

________________ (1973) Interim Water Quality Management Plan for Sewerage District No. 2, St. Bernard Parish, Louisiana. New Orleans, Louisiana: Burk and Associates, Inc.

These studies discuss the industries located within the districts that warrant consideration from a water facility viewpoint; exhibits show the location of the industry, treatment available, receiving stream and BOD and COD, etc.; contributors of nonpoint pollution also discussed.

Provide alternative recommendations; for example, the preferred alternative for District No. 1 is a new secondary treatment plant on the Forty Arpent Canal to remove the Violet raw discharge.

Louisiana Department of Health, Environmental Services (1976) Louisiana Municipal Discharges Inventory. Baton Rouge, Louisiana: Louisiana Department of Health.

Presents inventory of municipal discharges and priority list for treatment for the state of Louisiana.

State of Louisiana (FY 1976) Water Pollution Control Program (Part D). Baton Rouge, Louisiana: Louisiana Streat Control Commission.

Industrial inventory and industrial priority list for treatment for industries in the state of Louisiana.

The basis for assessing the water quality of municipal and industrial discharges is State of Louisiana (1973) Water Quality Criteria. Baton Rouge, Louisiana: Louisiana Stream Control Commission.

Includes listing of streams, bases for criteria, enforcement of criteria; general criteria: aesthetics, color, floating, suspended-settleable solids, taste and odor, toxic substances, oils and greases, foaming or frothing materials, nutrients, turbidity; water use classification.

Orleans Parish is presently switching from dumping sewerage into the Mississippi River to sending it to treatment plants. There is a treatment plant in Algiers and another one is planned for Eastern New Orleans.

There are a number of engineering feasibility reports on file at the Sewerage and Water Board office, which provide information on the treatment facilities and procedures.

Maps showing existing sewer lines in the city are available at the Sewerage and Water Board and are constantly updated.

Also see Barnard, James L. and W. W. Eckenfelder (1971) Treatment-Cost Relationship for Industrial Waste Treatment. New Orleans, Louisiana: Barnard, Inc.

In accordance with the subdivision regulations of the city, developers must supply their own drainage and sewerage systems if the development is located where it cannot be reasonably served by the extension of an existing public system. See City Planning Commission of New Orleans (1950) Subdivision Regulations for the City of New Orleans. New Orleans, Louisiana: City Planning Commission.

Also see New Orleans City Planning Commission (n.d.) Staff Report on Orlandia. New Orleans, Louisiana: City Planning Commission. Presents the staff's recommendations on the Orlandia development.

Professional Engineering Consultants Corp. (1972) St. Tammany Parish Comprehensive Water and Sewer Study. Baton Rouge, Louisiana: Professional Engineering Consultants Corporation.

Describes the abundant good quality ground and surface water available in the parish; amount of water available exceeds amount needed; need for additional water and sewerage systems discussed.

To discourage residential and land development without community type sewerage system, revision of subdivision regulations should be considered; suggests new regulations that would limit subdivisions with individual sewerage disposal systems to twenty lots.

Industrial/Commercial Development

Jefferson Parish: Consideration is still being given to the possibility of having I-410 cut through the parish, thereby leading to further development of the West Bank.

An industrial park is planned for Elmwood Park, located in the area bounded by Clearview Parkway to the east, Jefferson Highway to the south, Hickory Avenue to the west, and Airline Highway to the north.

Orleans Parish: Besides the plans for the commercial and industrial development in Orlandia, there are plans to improve the central business district of the city (this project is being directed by the Community Improvement Agency for the City of New Orleans).

St. Bernard Parish: Plans are being considered to gain jurisdiction over the river frontage, now held by the New Orleans Dock Board, and the MRGO frontage. The river frontage would lead to more wharving and warehouses, but limited use of the frontage is expected.

St. Tammany Parish: Has no comprehensive plan for development. Is in the process of writing proposals for a 30-acre industrial park in Slidell, near I-10 by the Slidell Airport, and a tourist development area in Mandeville.

Recreational Development

City Planning Commission of New Orleans (1970) Recreation Survey and Plan for New Orleans. New Orleans, Louisiana: City Planning Commission.

Provides inventory of existing facilities and activities; makes recommendations for future recreational development.

Colbert, Charles (1969) A Sketch Plan for a Comprehensive Parish-Wide Recreation Plan. New Orleans, Louisiana: Jefferson Parish Council.

Provides an inventory of existing facilities and makes recommendations for future recreational development (for Jefferson Parish).

Department of Recreation, Jefferson Parish (1970) A Complete and Detailed Study of All Areas and Facilities in Operation by the Jefferson Parish Recreation Department. Metairie, Louisiana: Department of Recreation.

Provides inventory of existing facilities and open space areas for the East Bank and the West Bank.

Hedrick, Earl J., et al. (1969) A Report on Open Space and Recreation. New Orleans, Louisiana: Regional Planning Commission.

Provides an inventory of existing regional open space and recreational area sites, broken down by parish, and by public and private facilities (for Orleans, St. Bernard, and Jefferson).

Louisiana State Parks and Recreation Commission (1974) Outdoor Recreation in Louisiana: 1975-1980. Baton Rouge, Louisiana: Louisiana State Parks and Recreation Commission.

Discusses institutional resources--the federal, state, and local agencies which are involved in recreational development; discusses the potential recreational areas of the state, including trails, scenic rivers and roads; presents problems and proposed actions for providing recreational opportunities for state residents and visitors.

Regional Planning Commission (1969) A Report on Open Space and Recreation in the Tri-Parish Area. New Orleans, Louisiana: Regional Planning Commission.

Provides an inventory of existing open space and recreational area sites, with total regional assets; provides lists of regional activities, with dimensions and capacity standards for regional activities (for Orleans, Jefferson, and St. Bernard).

Orleans Parish: Plans are being made for inner city playgrounds; for wetlands acquisitions to be used for water trails and access to natural beaches; for the land between Chef Menteur and Rigolets to be developed into a park around Blind Lagoon; and for two Indian mounds around Orlandia, Little Oak and Big Oak, to be preserved.

St. Bernard Parish: Plans are being developed for a 30-acre park in the third ward and expansion of the park in the second ward; long-range plans call for a wilderness park between the back levee and the MRGO, with camps, etc.

Shoreline Development

Burk and Associates, Inc. (1975) Resource Inventory of Coastal Louisiana. New Orleans, Louisiana: Burk and Associates, Inc.

Volume III presents a master inventory of all proposed, under construction, and completed projects of the Corps of Engineers; also includes a listing of projects being undertaken by the Department of Highways, Soil Conservation Service, and public and quasi-public sources.

City Planning Commission of New Orleans (1975) Coastal Zone Management Plan. New Orleans, Louisiana: City Planning Commission.

Provides a description of the four major environmental areas of the city; presents alternative management options; presents nine problem areas having to do with natural resources and makes recommendations for remedial action to maintain the present shoreline.

Coastal Environments, Inc. (1972) Environmental Baseline Study for St. Bernard Parish. Baton Rouge, Louisiana: Coastal Environments, Inc.

Provides a description of the major environmental units in the parish; presents recommendations for preserving, conserving, or developing the various units; recognizes that wetlands constitute the major asset of St. Bernard Parish.

__________________ (1976) Resources Management: St. Bernard Parish Wetlands. Baton Rouge, Louisiana: Coastal Environments, Inc.

A companion to the 1972 study; provides information on how to determine goals and development alternatives, and arrange funding for goal implementation.

U.S. Army Corps of Engineers (1974) New Orleans-Baton Rouge Metropolitan Area: Plan of Study. New Orleans, Louisiana: U.S. Army Corps of Engineers.

Presents a description of existing conditions--socioeconomic and water resources--in the study area and the Corps' goals and objectives for improving them; lists available information and data.

____________________ (1975) Water Resources Development in Southern Louisiana. Vicksburg, Mississippi: U.S. Army Corps of Engineers.

Presents an overview of current and proposed levee systems, describing location, costs, and purposes.

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Bruce, David (1976) Environmental Planner, Environmental Services, Division of Health, New Orleans, Louisiana, personal interview, June 29.

Burk and Associates, Inc. (1973) Interim Water Quality Management Plan for Sewerage District No. 2. New Orleans, Louisiana: Burk and Associates, Inc.

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Burk and Associates, Inc. and Earth Satellite Corporation (1974) Land Use and National Features Inventory: Jefferson Parish, Louisiana. New Orleans, Louisiana: Burk and Associates, Inc.

Chetta, Angelo (1976) Director, St. Bernard Planning Commission, Chalmette, Louisiana, personal interview, June 24.

Ciko, Larry (1976) "Barrier Plan Opposition," Times-Picayune, September 19.

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__________ (1975) Coastal Zone Management Plan: Volume I-III. New Orleans, Louisiana: City Planning Commission of New Orleans.

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Clement, Randolph (1976) Planner, City Planning Commission of New Orleans, New Orleans, Louisiana, personal interview, July 2.

Coastal Environments, Inc. (1972) Environmental Baseline Study: St. Bernard Parish, Louisiana. Baton Rouge, Louisiana: Coastal Environments, Inc.

__________ (1973) Environmental Considerations of an Expanded MRGO, Volume I. Baton Rouge, Louisiana: Coastal Environments, Inc.

__________ (1976) Resource Management: St. Bernard Parish Wetlands. Baton Rouge, Louisiana: Coastal Environments, Inc., draft.

Ford, Hugh (1976) Planning Director, Jefferson Parish Planning Department, Metairie, Louisiana, personal interview, July 8.

Jefferson Parish Council (1974) Comprehensive Zoning Ordinance: Ordinance #3813 as amended by Ordinance #7530. Jefferson Parish, Louisiana: Jefferson Parish Planning Council.

Jefferson Parish Planning Department (1972) Subdivision Regulations for Jefferson Parish. Metairie, Louisiana: Jefferson Parish Planning Department.

Louisiana Advisory Commission (1973) Louisiana Wetlands Prospectus: Conclusions, Recommendations and Proposals. Baton Rouge, Louisiana: Louisiana Office of State Planning and Louisiana State University Center for Wetland Resources.

Louisiana State Parks and Recreation Commission (1974) Outdoor Recreation in Louisiana: 1975-1980. Baton Rouge, Louisiana: Louisiana State Parks and Recreation Commission.

Louisiana Stream Control Commission (1973) State of Louisiana: Water Quality Criteria. Baton Rouge, Louisiana: Louisiana Stream Control Commission.

__________ (1976) Water Pollution Control Program (Part D). Baton Rouge, Louisiana: Louisiana Stream Control Commission.

Mumphrey, Anthony J. et al. (1975) Louisiana Metropolitan Wetlands: A Planning Perspective. New Orleans, Louisiana: Urban Studies Institute, University of New Orleans.

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N-Y Associates (1973) Interim Land Use Plan. New Orleans, Louisiana: Regional Planning Commission for Jefferson, Orleans, St. Bernard and St. Tammany Parishes.

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Rushton, Bill (1974) "St. Tammany's Emerald Forest Fight: How the Rich, the Locals, and the Mafia Are Maneuvering for Control." The Courier, November 7-13, 4-8.

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Sollberger, Kenneth and Martha (1976) St. Tammany Environmental Council, Mandeville, Louisiana, personal interview, July 16.

Taylor, Beth (1976) "'75 Louisiana Seafood Catch Reached $88 Million," Times-Picayune, August 8.

Terranova, Donald R. (1976) Principal Planner, Jefferson Parish Planning Department, Metairie, Louisiana, personal interview, June 23.

Times-Picayune (1976) "Council Approves Land Use Plan for Orlandia Project," July 30.

U.S. Army Corps of Engineers (1973) Flood Control: Lower Mississippi River Valley. Vicksburg, Mississippi: U.S. Army Corps of Engineers.

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__________ (1975) Water Resources Development in Louisiana. Vicksburg, Mississippi: U.S. Army Corps of Engineers.

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__________ (1972) Public Law 92-583, Coastal Zone Management Act of 1972. Washington, D.C.: U.S. Government Printing Office.

__________ (1972) Public Law 92-500, Federal Water Pollution Control Act Amendments of 1972. Washington, D.C.: U.S. Government Printing Office.

CHAPTER 3

LAND REQUIREMENTS BY CATEGORY: 1980-1985

PURPOSE AND SCOPE

The purpose of this chapter is to present local planning officials with a summary of the probable amount and location of each category of land use in their parishes projected to 1985. A knowledge of the expected amount and kind of growth of the New Orleans Standard Metropolitan Statistical Area (NOSMSA), and the probable locational pattern of this growth within the area, should be useful in constructing workable programs for coastal zone management.

The presentation is interactive. The views and opinions of planning officials in each parish have been taken into account in the development of the study. Their opinions of planning officials in each parish have been taken into account in the development of the study. Their opinions have been used to modify findings made by the study team in order to ensure basic congruence with local planner perceived reality. Some value should also derive from the background research and the development of the projections. Even where modification of the projected needs is considered necessary by local officials, the techniques and bibliography of the chapter should serve as a baseline on which to base those changes.

The findings of this study are only a partial sketch, in general painted with a broad brush, of what could occur with regard to changes in land use by 1985. The projections take no account of political regulation such as zoning ordinances or tax structure. Rather, they attempt to show the effects of unregulated economic and demographic growth on the uses of land. Several other studies either have been completed (Mouledous, 1975; N-Y Associates, 1973; Regional Planning Commission, 1976) or are underway, which explore aspects of land use from different perspectives and with a greater or lesser degree of detail.

The need for studies of this sort should be clear. The possible benefits of such planning include: (1) improved social and environmental qualities through the provision of appropriate infrastructure when and where it is needed, (2) increased efficiency in transportation systems, (3) improved economic efficiency through land acquisition and control, and (4) improved tax base analysis for future fiscal periods.

Beyond the benefits which accrue to all urban areas from general land use planning, the New Orleans SMSA can also gain insight into the pressures on the viable wetland areas of the coastal zone. These pressures are a natural consequence of growth in size and density of the urban sphere. Knowledge of the direction and force of expected change can lead, with proper management techniques, to a mitigation of environmental impacts in the proximate coastal areas.

The scope of this chapter is limited to the projection of published data (modified by expert opinion as described above) to ascertain macro-scale changes in land use for the period 1972 to 1985 for the four parishes in the New Orleans SMSA. The approach is basically deterministic rather than probabilistic; hence, a change in an important parameter which is not recognized at this time could require restructuring of the findings.

OVERVIEW OF THE METHODOLOGICAL APPROACH

The methodology used in this chapter is comparatively unsophisticated. Time, cost, and data constraints limited the choice of projective and allocative techniques to those which are relatively simplistic. One advantage of this admitted limitation is that planners who may want to duplicate the process using a different set of assumptions or undated data will find it relatively easy to do so. It should be noted, however, that alternative forecasting techniques are available (c.f. Chapin and Weiss, 1962; Feldt, 1965; Forrester, 1969; Hill, Brand and Hansen, 1965; Lathrop and Hamburg, 1965; Lowry, 1964).

The primary tool used here is known in the literature as the "Planned Requirements Approach" (PRA) (Chapin, 1965; Mumphrey et al., 1975; Krueckeberg and Silvers, 1974). Simply put, the PRA assumes a certain constancy (or known rate of change) for each category of land use in its areal requirement per person of user polulation. Hence, when total population--expressed in household units--and employment by category are known for a certain base year, and when land use maps showing residential and industrial locations and acreages are available for that same year, then a base year inventory of land requirements per person, by category, can be constructed. Now, if reasonably accurate employment and population estimates for some year in the future can be made, then the set of intensity ratios derived above can be applied to determine approximations of land requirements for each use type in the future year.[1]

Once the incremental requirements have been projected, they must be located spatially. Herein lies the difficulty with the Planned Requirements Approach: a set of assumptions must be made with regard to factors influencing the location of each activity, then the planner's judgment must be incorporated to allocate each use. This process is, of course, subject to human error.

One technique to achieve this allocation (and the one used here) is constructed on the basis of established user priority. Basically, this approach assumes that existing uses of land have been determined on a rational basis (i.e., that eonomic forces in the market have caused an "efficient" utilization of land) and that the location of an addition to each activity is most likely to be on the vacant land

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[1]It should be emphasized that the estimated land requirements are only approximations; available land constraints, changes in consumer preference, geographical barriers and the like may cause necessary revisions in the intensity of use ratios.

nearest an existing facility (if certain other constraints are met) or on the same kind and quality of land elsewhere in the SMSA. This approach also assumes a hierarchy of land uses, such that those users which require specific locations of land will be able and willing to bid for this up to the limit of its differential return to them (Alonso, 1964).

Of course, the location of new increments of most categories of land use also depends to a greater or lesser degree on the distance to, and accessibility of, the central core. Transportation corridors and modal splits will help, therefore, to shape the eventual location of each land use.

Each of these factors must be incorporated (along with others) into the assumptions regulating the allocation of land. In New Orleans and in many other places, geography also introduces another factor: the possibility of land improvement. It is possible to increase the amount of developable land in this area by draining and filling the proximate wetlands. As growth occurs and density increases, new additions to each type of land use are forced further from the central core. At some point, the transportation costs involved with the use of already developable land outweigh the (private) costs of land improvement. Land allocations for each activity in each parish are made here for various sets of assumptions including some wetland development and no wetland development. The resulting spatial settlement patterns are presented as alternatives.

POPULATION DATA BASE AND PROJECTIONS TO 1985

Confident prediction of the amount of land required for each use within the SMSA at some future date requires a substantial data base. In particular, population statistics should include (by parish) age and sex distributions, average household sizes, migration rates between political subdivisions, in-migration from other areas, and fertility and mortality rates (Wilson, 1974: 79-82). From these statistics, various projections of population in a future year may be constructed by holding most of the variables constant and varying others (e.g., fertility rates and in-migration).

The technique of projection most widely used is the cohort survival method, whereby a population sub-group (e.g., males, age 25-34) is "advanced" (taking account of mortality rates for this group) from the base year (t) to some future year (t + n). Since this method establishes a "base" population (i.e., not including net migration or the effects of fertility changes) with a high degree of accuracy, it is generally considered superior to other forms of population estimation (Goodman and Freund, 1968: 60).

Several studies using the above techniques, but with different migration and fertility assumptions, have been recently completed for the SMSA (c.f., Burford and Muryezn, 1972; Christou and Segal, 1973; Bureau of Economic Analysis, 1974; Bureau of the Census, 1972; Bureau of the Census, 1975). The most recent and perhaps the most accurate, is the Segal et al. study (1976). With some reservations about the predicted distribution of future population within the SMSA, the figures generated by this study should be more accurate than the preceding ones because it utilizes the increased inmigration and decreased fertility rates which have apparently become sustainable trends in the past few years. Tables 3.1 and 3.2 summarize the relevant data from the Segal study and from the 1970 census.[2]

Two major criticisms of the Segal study must be noted. It does not take account of the amount of available land for residential expansion in each parish, and it does not check the expected population against expected employment. These shortcomings will be dealt within the appropriate sections of this report.

EMPLOYMENT DATA BASE AND PROJECTIONS TO 1985

There are currently no employment projections for the New Orleans SMSA which are comparable in scope and depth to the Segal population study (Fennel, 1976). The most comprehensive set of recent projections (Bureau of Economic Advisors, 1974) projects only total employment. This study, furthermore, is in the process of revision necessitated by a failure of the agency to recognize the continuing shift of population and industry to the South (Garnick, 1976). The

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[2]For reasons which become clear in a later section, 1972 has been selected as the base year for this study. Population figures for this year have been interpolated from the Segal study.

TABLE 3.1

POPULATION CHANGE BY PARISH, 1970-1985

Parish & Statistic (Year)	1970	1975	1980	1985
Total Population-SMSA	1045809	1104117	1172503	1252654
Change in Population from 1970	--	58308	126694	206845
% Change in Population from 1970, 1975 etc./ from 1970	--	5.57/5.57	6.19/12.11	6.84/19.78
% of SMSA change	--	100	100	100
Number of Households	318418	365687	405360	455693
Total Population-Jefferson	337568	400220	471543	539249
Change in Population	--	62652	133975	201681
% Change in Population	--	18.56/18.56	17.82/39.69	14.35/59.74
% of SMSA Change	--	107	106	97
Number of Households	99512	121318	147885	177325
Total Population-Orleans	593471	571659	548911	541964
Change in Population	--	(21812)	(44560)	(51507)
% Change in Population	--	-3.67/-3.67	-3.98/-7.51	-1.27/-8.68
% of SMSA Change	--	-37	-35	-25
Number of Households	191363	205354	210863	223209
Total Population-St. Bernard	51185	59086	68408	76986
Change in Population	--	7901	17223	25801
% Change in Population	--	15.44/15.44	15.77/33.64	12.53/50.41
% of SMSA Change	--	13	14	12
Number of Households	13709	16813	20007	23531
Total Population-St. Tammany	63585	73152	83641	94455
Change in Population	--	9567	20056	30870
% of Change in Population	--	15.04/15.04	14.34/31.54	12.93/48.55
Number of Households	17834	22202	26605	31628

Source: Segal, *et al*. (1976). Percentages derived by authors.

TABLE 3.2

CHARACTERISTICS OF THE POPULATION: 1970-1985 NOSMSA

CHARACTERISTIC	1970	1980	1985
Average Household Size	3.3[1]	2.9[4]	2.7[4]
Non-White Population	328970[1]	360624	381367
Working Age Population	639075[1]	775611	831755
W.A. Pop. as a % of Total Pop.	61	66	66
Median Family Income	$8444[3]	N.P.	N.P.
Income Per Capita	$3262[2]	$4455[2]	$5751[2]
Income Per Capita as a % of National Average	94[2]	93[2]	93[2]
Percentage of Families with Incomes above $10,000	40.5[3]	N.P.	N.P.
Percentage of Families with Incomes below $5,000	29.5[3]	N.P.	N.P.
Percentage of Families with Incomes Below Poverty Level	16.8[3]	N.P.	N.P.
Mean Family Income	$10764[3]	$12919[5]	$15528[5]

Sources: [1]Segal, et al. (1976).

[2]Bureau of Economic Analysis (1974).

[3]Bobo and Charlton (1975).

[4]Projected Population, 1980 ÷ Projected Households, 1980; projections from Segal et al. (1976).

[5]Income per capita x average household size.

N.P.-- not projected.

projection of employment by category for 1980 and 1985 is therefore a necessary sub-function of this chapter.

In projecting employment, the approach used is dictated by the data available. In the case of the New Orleans metropolitan region, the best source of historical data on employment is the Louisiana Department of Employment Security (LDES)(1975). This agency has been reporting "total wage and salary employment" statistics[3] for the currently defined SMSA since 1964. These statistics are reported by economic sector (e.g., manufacturing, wholesale trade, government, etc.) but are not disaggregated below the SMSA level. Also, they are reported on a place-of-residence rather than place-of-work basis. The latter has the effect of slightly understating employment in the metropolitan region.[4]

A percentage change in employment in each economic sector over the projection period is ascertained. (For these purposes, the data is adequate.) The projection technique is extrapolation by sector of a linear trend line. This analysis yields a correlation coefficient (r) of total employment with time of .962, which is considered satisfactory for projection purposes.

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[3]Does not include the self-employed, agricultural workers or owner-operator categories.

[4]The LDES statistics can be expected to understate wage and salary employment by an amount approximately equal to the number of commuting workers from nonSMSA parishes minus the number of workers who reverse commute.

A check on the reasonableness of the projected figures can be made by comparing the ratio of total employment in the base year over the base year working age population with the same ratio for 1980 and 1985. The results of the test indicate that approximately 2 percent less of the working age population will be employed in 1985. This seems consistent with the trend of slowly decreasing labor force participation rates which have been recently evidenced (Office of Management and the Budget, 1973: 118). Furthermore, it is likely that manufacturing employment will level off rather than continue downward, mitigating the 2 percent discrepancy. In 1975, manufacturing employment did not decrease; the "conservative expectation is for flat employment in this sector through 1980 and slightly increasing employment thereafter" (Flores, 1976). Table 3.3 shows the expected employment in 1980 and 1985 as projected.

Marginal considerations aside, the next ten years should show rapid increases in wholesale and retail trade and even more rapid increases in service and miscellaneous and government employment.

LAND USE DATA AND SELECTION OF THE BASE YEAR

A prime requisite of the Planned Requirements Approach to land use planning is a reasonably accurate land use map for the base year (Goodman and Freund, 1968: 108). This map and its associated inventory of land uses form the basis from which population and employment intensity ratios for

TABLE 3.3

EMPLOYMENT BY CATEGORIES NOSMSA

1972 and 1980, 1985 (Projected)

EMPLOYMENT CATEGORY	1972	1980	1985
Total Wage and Salary Workers	395,600	458,700	497,700
All Manufacturing	53,700	48,900	45,900
Construction	26,500	26,200	26,500
Wholesale Trade	31,300	36,800	40,100
Retail Trade	66,500	80,200	89,000
Finance, Insurance, and Real Estate	24,100	29,700	33,000
Service and Miscellaneous	74,400	97,600	111,600
Tansportation, Communication, and Utilities	42,500	43,600	43,300
Government	63,100	79,900	91,400
Extractive	13,500	15,800	16,900

Source: Derived by extrapolation from LDES, 1975.

Notes: (1) In the study, manufacturing employment is treated as if it remains constant. See page 12.

(2) The LOOP Superport will have a minor, but beneficial, effect on employment in the NOSMSA before 1985. Of the 3,200 new jobs projected for the area, approximately 1,600 will be in petroleum refining (the manufacturing sector)(Perrin, 1976). The remainder will be in petrochemical and secondary development. The employment generated by this project is assumed to be accounted for in the projections.

each activity are drawn. They also serve to indicate existing and expected locations of major land uses. Finally, the map shows the location and quantity of available developable land.

The State Planning Office has recently made available a new land use survey for Louisiana (1975) which contains maps at the scale of 1:125,000 (1" ≈ 2 miles) and an inventory of major uses in acres by parish for 1972. The scale of the map is not really fine enough for city planning or even some parish planning purposes.[5] For these, it would be more desirable to have acreages reported by traffic zone or census tract and to have economic activities much more finely disaggregated. The scale is, however, quite useful at the regional level. It allows parish-by-parish comparison of major land uses and is therefore functional in showing the broad thrusts of development trends. Table 3.4 summarizes the existing uses of land and types of undeveloped land for 1972 for the SMSA and its four parishes.

The classification scheme for Table 3.4 and the definitions of each type of land are found in Appendix 3.1. Certain notes about this scheme are necessary here in order to understand the projection process:

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[5]The smallest delimited parcels on the land use map are approximately ten acres, or roughly the size of a school plus its playground or a small shopping center.

TABLE 3.4

LAND USE IN THE NEW ORLEANS SMSA, 1972
(in Acres)

LAND USE	JEFFERSON	ORLEANS	ST. BERNARD	ST. TAMMANY	SMSA
Urban & Built Up					
11 Residential	27,911	26,429	4,446	20,254	79,040
12 Commercial & Service	2,717	3,211	247	1,235	7,410
13 Industrial	5,434	4,940	741	494	11,610
14 Extractive	44,707	988	--	2,223	47,920
15 Trans., Comm., Util.	1,729	2,717	--	741	5,190
16 Institutional	741	1,235	--	494	2,470
17 Strip & Cluster	2,223	1,235	1,976	5,928	11,360
18 Mixed Use	--	--	--	--	--
19 Open & Other	5,928	4,940	741	1,976	13,585
Agricultural					
21 Cropland & Pasture	3,705	247	2,223	90,876	97,071
22 Orchard & Grove	--	--	247	2,964	3,211
23 Feeding Oper.	--	--	--	--	--
24 Other	--	--	--	247	247
Forest Land					
41 Deciduous	3,705	5,681	10,374	6,422	26,182
42 Evergreen	--	--	--	76,076	76,076
43 Mixed	--	--	--	167,219	167,219
All Water Features					
51-55	363,337	97,812	1,212,770	148,941	1,823,354
Wetland					
61 Forested	26,429	6,669	4,199	122,265	159,562
62 Non-Forested	81,263	58,292	261,326	57,075	457,938
All Barren Land					
71-75	14,573	741	27,911	--	43,225
TOTAL AREA	584,402	215,137	1,527,201	705,926	

Source: State Planning Office (1975).

1) For projection purposes, "residential" land (category 11) and "strip and cluster settlement" (17) are considered together by the State Planning Office. The relevant user population measure is total households.

2) Also for projection purposes, "Commercial and Service" (12) and "Institutional" (16) are considered together by the State Planning Office (SPO). This is necessitated by the way in which employment data are reported. Included in this employment category are workers in "wholesale and retail trade," "finance, insurance and real estate," "service and miscellaneous," and "government."

3) "Industrial" (13) land use is projected, using "manufacturing" employment and "contract construction" employment. This is consistent with SPO procedures.

4) The "extractive" category is not projected since oil and gas are not ubiquitous. This land use in the SMSA includes only the oil and gas fields, not the industrial complexes which accompany them. The latter are classified under "industrial."

5) The "open and other" category (19) includes vacant land within the SMSA which is totally bounded by developed land. It also includes urban parks and recreational spaces which, while 'vacant,' are not

subject to development. The existing supply of park areas must be subtracted from this total. See Table 3.4.

6) "Agricultural" land (21-24) and all "forest" land (41-43) are considered residual uses in the SMSA. They combine with the net available open land to form the available prime land for development.

7) Within the wetlands category, "forested" wetlands (61) are more economically developable than "non-forested" wetlands (62). It is ecologically less desirable to develop unleveed wetlands than those which have been leveed.

8) "Barren" land (71-75) is not considered developable.

The information from Table 3.4 was combined with the base year data from Note 2 and Table 3.3 (as described above) to create a set of land use intensity ratios for residential and economic activities. The results are shown in Table 3.5. Note that the ratios for residential land use were computed for each parish. This allows a rough measure of density versus distance from the central city to be computed (See Figure 3.1). Economic activity land use ratios were computed at the SMSA level. This technique allows allocation of industrial and commercial activities at an areally constant ratio over the entire region, but allows the acreage per household to vary with distance from the center.

Note also that ratios for recreational land have not

TABLE 3.5

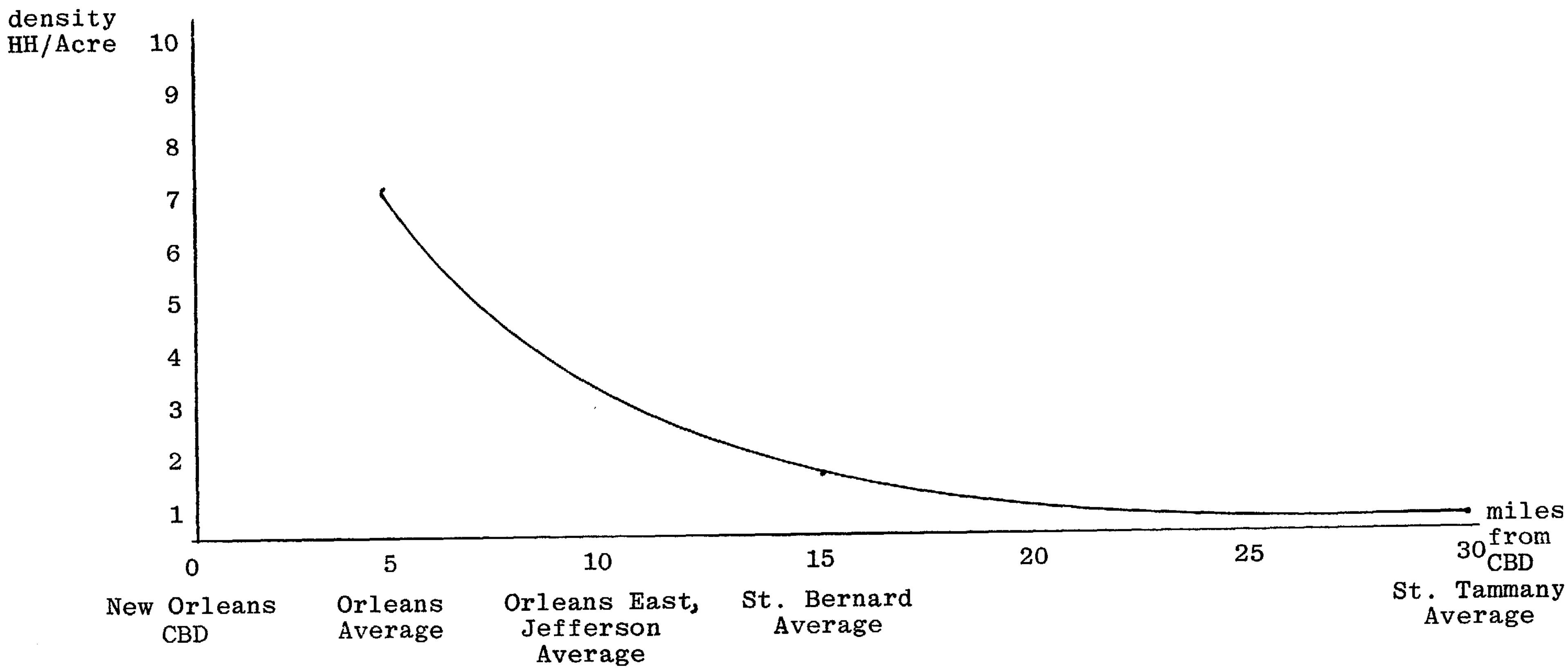
LAND USE INTENSITY RATIOS--1972

(1) CATEGORY OF LAND USE Description		Acreage	(2) USER TYPE Description	Number	INTENSITY RATIO (1) ÷ (2) Acreage/Person
11, 17 Res. & Strip dev.	Jefferson	30134	Households	105000	.29
11, 17 Res. & Strip dev.	Orleans	27664	Households	197900	.14
11, 17 Res. & Strip dev.	St. Bernard	6422	Households	14875	.43
11, 17 Res. & Strip dev.	St. Tammany	26182	Households	19170	1.36
11, 17 Res. & Strip dev.	SMSA	90402	Households	336945	.27
12, 16 Comm., Serv., Inst.,	SMSA	9880	Employ. in Trade, Finance, Insurance, Real Estate, Serv. & Misc. & Government	259400	.038
13 Industrial		11610	Manufacturing & Construction, Employment	80200	.145
15 Trans., Comm., Utils.		5190	Employment in Trans., Comm., and Utils.	42500	.122

Source: Derived from Tables 3.3 and 3.4. See Note 2.

FIGURE 3.1

RESIDENTIAL DENSITY FUNCTION: NOSMSA 1972



Source: Derived by authors from Table 3.5.

been calculated. This land use will be added to the "open and other" category on the basis of "facility need per person" as established in the literature in a later section.

PROJECTION OF LAND REQUIREMENTS

The ratios obtained in Table 3.5 are applied to the population and employment projections in Tables 3.1 and 3.3 to obtain first approximations of the amount of land necessary for each category of use in 1980 and 1985. These projections are listed in Table 3.6.

The table shows that the developed land area of the city (excluding urban recreation) may be expected to increase by 42 percent from 1972 to 1985. Of this increase, the residential land use increment is approximately 92 percent. While technically possible, this extrapolation seems infeasible for several reasons:

1) it takes no account of available land constraints;
2) it makes no adjustment for the effects of increased transport cost on density;
3) it does not take account of the fact that in newly opened tracts of housing (such as those in St. Tammany parish), open land exists within the residential category (i.e., some housing tracts have not been developed to capacity);
4) it makes no adjustment for the effect of changing family size and lifestyle (i.e., a location and

TABLE 3.6

CONSTANT RATIO LAND REQUIREMENTS: 1980, 1985

CATEGORY OF LAND USE	LAND USE INTENSITY RATIO 1972	1972 ACRES	1980 ACRES	1985 ACRES	CHANGE 1972-1980	CHANGE 1972-1985
Residential						
Jefferson	.29	30,135	42,885	51,425	12,750	21,290
Orleans	.14	27,665	29,520	31,250	1,855	3,585
St. Bernard	.43	6,420	8,605	10,120	2,185	3,700
St. Tammany	1.36	26,180	36,185	43,015	10,005	16,835
SMSA AVERAGE	.27	90,400	117,195	135,810	26,795	45,410
SMSA						
Industrial	.145	11,610	11,610	11,610	--	--
Commercial, Services, and Institutional	.038	9,880	12,320	13,875	2,440	3,995
Tansportation, Communication, and Utilities	.122	5,190	5,320	5,320	130	130
Urban Use Excluding Recreational	--	117,080	146,445	166,615	29,365	49,535

Source: Derived by authors from Tables 3.1, 3.3 and 3.5.

type of desired residence).

All of the above are directed primarily at the residential land use projections. Since this category represents such a large proportion of the total, these criticisms must be answered. In comparison, the possible errors in total land use change introduced by the three economic activities will be minor. The projections of these are considered acceptable.

The next sections analyze the effect of the four problem areas noted above on the projection of SMSA residential land. The following section also considers the existing supply of recreational land and net effects of removing this land from the "open and other" category.

LAND AVAILABILITY IN THE NEW ORLEANS SMSA, 1972

Developable land may be classified along a spectrum from prime to marginal. Prime developable land is that which requires little or no improvement for residential use. Marginal land is land which requires such an amount of improvement that it will not come into use until the prime of prime (equivalently located) land has been bid above the cost of improving marginal land. In the New Orleans area, prime land may be considered to be all land in agriculture, all forest land and all land in the open and other category which has not been set aside for urban recreation.

Table 3.7 shows the quantity of developable prime land in the SMSA, by parish. From this quantity is subtracted the existing recreational open space to obtain available prime land for development.

A comparison of the land required for projected development (from Table 3.6) with the available prime land from Table 3.7 points out that on a SMSA basis, there is ample land for expansion and growth. In fact, while an increase of almost 50,000 acres of total development might be expected by 1985, this would be less than one-seventh of the prime land available.

Analysis of the distribution of available prime land by parish, however, shows an entirely different pattern. In Orleans parish, approximately 3600 acres would be required for housing alone, from a total of 8249 acres. The Jefferson figures are even more revealing. There are less than 13,000 total prime acres available (as of 1972); yet by 1985, if the projected population and density figures hold, over 21,000 acres would be required for residential use. The St. Bernard parish situation is not so critical. There are 13,400 acres available and the projected demand would be 3700 acres for housing.

Only in St. Tammany Parish is there a real surplus of available prime land. This land is higher, relatively well-drained, and quite developable. Unfortunately, at its nearest approach, it is approximately twenty-five miles from the intensely developed areas of the city.

TABLE 3.7

PRIME DEVELOPABLE LAND, BY PARISH--1972
(in acres)

CATEGORY	JEFFERSON	ORLEANS	ST. BERNARD	ST. TAMMANY	SMSA	NOTES
Total Area	584,402	215,137	1,527,201	705,926	3,032,666	
-All Water Features	-363,337	-97,812	-1,212,770	-149,435	-1,823,354	
Total Land Area	221,065	117,325	314,431	556,491	1,209,312	
-Urban & Built Up	-85,462	-40,755	-7,410	-31,369	-164,996	1, 2
Total Available	135,423	76,570	307,021	525,122	1,044,316	
-Wetlands and Barren Lands	-122,265	-65,702	-293,436	-179,322	-660,725	
Prime Land	13,158	10,868	13,585	345,800	383,411	
-Existing Parks and Open Recreational Space	440	2,619	163	537	3,759	3, 4
Available Prime	12,718	8,249	13,422	345,253	379,652	

[1] Includes category 14, "extractive." These lands are not in general developable for any other purpose.

[2] Does not include category 19, "open and other." A portion of "open and other" category is actually "developed" as parks and open recreation areas and is therefore not developable for other purposes.

[3] Figures include all urban recreational spaces 5 acres or larger. From Regional Planning Commission (1971).

[4] St. Tammany figure from Louisiana State Parks and Recreation Commission (1974).

Source: Derived by authors from Table 3.4.

The effects of land scarcity on the New Orleans side of Lake Pontchartrain will be manifold and they will increase over time. As the amount of available land decreases, its price will increase. As the price of land increases, the cost of housing increases. The result is somewhat indeterminate when taken out of context. At a minimum, however, it can be stated that:

1) Some of the potential population will be forced into higher density developments.
2) Some will be forced to live further from their places of work in order to secure satisfactory housing at a reasonable price.
3) Some will be forced to pay the higher cost of reclaimed land if such land is available.

A further consideration is that the total amount of available prime land now existing cannot all be used for housing. In fact, housing does not compete equally with industrial or commercial bidders. Further, a certain amount of the open land should be set aside for urban recreation. In order to establish an approximate base quantity of land available in each parish, a provisional allocation of industrial, commercial and service, transportation, communication and utilities, and urban recreational space has been made in Table 3.8.[6] Recreational space needs have been

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[6]The economic activities have been allocated to each parish on the basis of existing areal ratios (e.g., 1985 Commercial and Service in Jefferson Parish = $\frac{\text{1972 Comm \& Serv, Jeff}}{\text{1972 Total Comm \& Serv}}$ X 1985 Total Commercial & Service).

TABLE 3.8

LAND AVAILABILITY BY PARISH, 1985--AFTER PROVISIONAL

ALLOCATION OF ECONOMIC ACTIVITIES AND RECREATION
(in Acres)

CATEGORY OF LAND USE	JEFFERSON	ORLEANS	ST. BERNARD	ST. TAMMANY
Available Prime Land 1972	12,718	8,249	13,422	345,263
-Change Industrial Land 1985	--	--	--	--
-Change Commercial, Service and Institutional 1985	1,398	1,798	100	699
-Change Transportation, Communication and Utilities 1985	43	68	0	19
-Needed Urban Recreational Land 1985-Existing Supply 1975	3,460	1,291	397	143
=Prime Land Available for Residential Development 1985	7,817	5,092	12,925	344,402

Source: Recreation Figures from Louisiana State Parks and Recreation Commission (1974). Rest of Table derived by authors from Tables 3.6 and 3.7.

computed on the basis of expected 1985 population from Outdoor Recreation in Louisiana 1975-1980 (Louisiana State Parks and Recreation Commission, 1974). This will, of course, require revision based on the final allocation of population in 1985.

Since the "pattern" of settlement will largely determine the final intensity ratios (or, in other words, residential density), and since this pattern of settlement is affected not only by the availability of prime land, but also by available transportation, changes in consumer reference, and the availability and price of filled land, the projected quantity of needed land must be determined simultaneously with its location.

THE TRANSPORTATION SYSTEM: ITS EFFECTS ON THE ACCESSIBILITY OF DEVELOPABLE LAND

Given the shortage of available prime land near the center city (as described in the preceding section), the question of residential location largely devolves to analysis of access to the developable land which does exist. If this access is not relatively easy, the costs of land reclamation may well be below the cost of transportation. Clearly, the transportation systems of 1980 and 1985 will greatly influence the pattern of settlement of the corresponding increments of population.

Those transportation factors which stand out as influencing the spatial allocation of residential growth in the New Orleans SMSA most are:

1) the availability and cost of fuel for private automobiles

2) the ease of river crossings

3) the availability of rapid transit across Lake Pontchartrain

4) the availability of mass transit to and from outlying areas.

These factors are of particular importance when the areal distribution of prime land is considered as shown below.

Consultation with planners in Jefferson Parish yielded the information that there is little available land of any nature (prime or marginal) left on the East Bank.[7] The development of the West Bank, while proceeding rapidly, is limited both by the amount of land and by access to major transportation corridors (Terranova, 1976). A Jefferson-to-Jefferson bridge is considered a necessity if the parish is to house its "expected" 1985 population.

In Orleans Parish, almost all of the available prime land is across the river in an area known as the Lower Coast of Algiers. This area, of approximately 4700 acres, could house more than 50,000 people if developed in a New Town configuration (New Orleans City Planning Commission, 1975). It could, at maximum density, house even more, perhaps as many as 100,000 people (Mumphrey and Waterman, 1976).

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[7] Vacant land which is shown on the 1972 base map (in the Kenner area) has, in large, been developed.

One primary reason that this choice land has not yet been developed is that access to it is very poor. Providing access would entail at least a Mississippi River Bridge at Chalmette and upgrading of arterials on either side of the River.

According to very recent statistics (Tri-S, 1976) St. Bernard Parish has become the second fastest growing parish in the state since 1970. This is not particularly surprising when it is realized that this parish contains the bulk of the developable prime land near the center city. Also, this land is relatively accessible: no bridges across the Mississippi are necessary to reach it. The pace of development likely will not be maintained for long, since as the prime land lies mainly along a natural levee of the Mississippi in a narrow ridge. New development is forced out along this corridor which rapidly diverges from the area of the developed core.

St. Tammany Parish is now the fastest growing parish in the area (Tri-S, 1976). (Note that both St. Tammany and St. Bernard have moved ahead of Jefferson; this is a situation not predicted by the Segal population projections. It must, however, be remembered that these growth percentages are calculated from relatively small base populations.) The situation in St. Tammany is that its growth is limited to those families which can afford the time and money to commute across Lake Pontchartrain at least until substantial development of job opportunities occurs in the parish.

The Transportation Improvement Program, FY77 (fiscal year 1977) which also contains projections to 1981, yields some insight to the question of future access to these developable areas (Regional Planning Commission, 1976b). In general, the plan shows continued commitment to private auto transportation, but with significant recognition of the need for improved mass transit. With regard to automobile transportation, "the most significant development in the (extended) time frame will be the construction of the downstream parallel span bridge" (Voneida, 1976). No other bridges across the Mississippi are shown as even contemplated.

Most of the highway and street improvements are planned for already developed areas: some to relieve increasing congestion, others more in the way of routine maintenance. Notable exceptions with regard to street construction help to delineate the expected pattern of development. In particular, the plans show extension and upgrading of roads in Orleans Parish from Interstate 10 to the Mississippi River Gulf Outlet. In West Jefferson, most new construction is planned in the area of the Westbank Expressway and Lapalco Boulevard (Regional Planning Commission, 1976b).

The effect of these roads will be to open new areas for subdivision and residential construction. Much of the land so opened, however, is presently wetlands and is, therefore, of marginal developability. There are no plans shown for improving access to the upstream areas of West Jefferson or to the Lower Coast of Algiers. St. Bernard will become more accessible through improvements to Louisiana 46 and Louisiana 47 (Paris Road). There is little to be done to bring St. Tammany "closer" for automobile traffic beyond the construction of a new causeway, which is not even in the planning stages.

Automobile access in 1980 will remain roughly similar to that in 1976. By 1985 the planned Mississippi River Bridge may be completed; but, if the recommended corridor is used, this bridge will do little more than relieve existing congestion on the current bridge. Since it takes approximately five years from the beginning of construction to operation, it is unlikely that any other bridges can be planned and built before 1985 (Voneida, 1976).

Gasoline and related fuel products are expected to remain relatively plentiful for the forseeable future, barring another OPEC embargo. The price of this fuel will increase at a rate above the rate of inflation, due to increased drilling costs as well as politically administered prices (Commoner, 1976). Apparently, the American driver has been willing and able to absorb the increased price of gasoline as is shown by the fact that 1975-76 consumption is the highest ever (Motor Trend, 1976). The importance of these related items is that distance alone is probably not a deterrent to the settlement of an outlying area. Families who desire and can afford to do so are still likely to locate in the exurban subdivisions.

A large number of New Orleanians, however, are not capable of absorbing the costs involved with a long daily commute. For most of these, mass transit is an obvious answer. With so little land available near the primary employment nexus of the central city, the availability of transit to outlying areas is crucial. In the past, New Orleans proper has had adequate-to-excellent mass transit, but the suburban parishes have not. This situation could change in the next ten years.

All of the parishes show some commitment to improving mass transit as is shown by the equipment upgrades listed in the Transportation Improvement Program (Regional Planning Commission, 1976b: i, ii). The sufficiency of such programs is not ascertainable in light of the unknown effectiveness of the proposed Regional Transportation Authority. A significant improvement in transit to the central city from eastern New Orleans and Jefferson Parish should devolve from the Park-and-Ride operations. These could lower travel and parking costs, decrease highway congestion, and improve the access of low and moderate income families to areas in eastern New Orleans.

There are no expectations of an in-place rapid transit system being developed before 1985. Such systems are being considered, both with regard to mode and corridor, but their implementation is costly and time consuming. A rapid transit system around, or across, Lake Pontchartrain is a long-term possibility; however, it will not influence the settlement pattern of the population increment relevant to this study (Thayer, 1976).

With the transportation factors in mind, a survey of the demographic and economic characteristics of the population whould help to clarify the location and type of housing which will be built. The next section analyzes these considerations.

HOUSING COSTS AND INCOME

Table 3.2 shows that certain demographic and economic characteristics of the New Orleans SMSA population are changing. Most importantly, there will be more people in the working age population and fewer (relatively) in age groups which traditionally have required private and public support (the old and the young). A related statistic shows family size declining as a result of the lower fertility rates. Also, real income per capita is expected to increase at approximately the same rate as the national average which will mean an increase in effective buying power.

In-migration to the SMSA as a whole will make up about 25 percent of the population increase. Most of the immigrants will be in the 25-34 age group and will contribute directly to the working age population. Further, since the rural to urban migration is largely over (due to the depopulation of the agricultural lands in previous decades), this group can be expected to bring urban skills and adjustments to the SMSA (Taeuber, 1973: 3-5).

These trends suggest that the New Orleans SMSA will be relatively more affluent in 1980 and even more so in 1985. A smaller proportion of total personal income will be necessary to support schools and senior citizens, thus increasing personal disposable income. It appears that the latter will partially offset the increase in transportation costs alluded to in the previous section. However, before analyzing the effect of these changes on the effective demand for housing, it is also necessary to evaluate the changes in the costs of housing relative to income.

The most important consideration in this regard is that the price of all housing has been (and is expected to continue) increasing at a rate faster than family income. From 1967 to 1972, median family income nationally increased by 12 percent, while the price of shelter increased by 23 percent (Council of Economic Advisors, 1974: 274, 300). This trend implies that a house which cost $25,000 in 1970 would cost approximately $46,500 in 1985. In order to comfortably afford a $25,000 house in 1970, a family would have needed an income of $10,000 per year. It would need to earn at least $18,600 in 1985 to buy the same house. But the projected income of that family for 1985 is about $14,000.

While the above could pose a national problem of some magnitude, it is a critical consideration in evaluating the demand for housing in New Orleans. In New Orleans proper, only about one-third of the households own (or are buying) a family home. For the SMSA, the proportion of home owners to total households is approximately 45 percent (Bureau of the Census, 1972). In the United States, the home ownership rate is nearly 55 percent. There is every indication that the low rate of home ownership in New Orleans is directly attributable to the highly skewed distribution of income. Median family income in the United States in 1970 was more than $10,600 (Council of Economic Advisors, 1974: 274). In the New Orleans SMSA, median family income in that year was only $8,444. Perhaps more importantly, only 40.5 percent of all families had annual incomes over $10,000 and 29.5 percent had incomes below $5,000 (Bobo and Charlton, 1975: 172-3). The structure of expected employment increases is such that while all incomes will increase absolutely, the distribution will remain skewed because most of the employment additions will likely be in the lower paying service and commercial areas (see Table 3.3).

As a result of increasing shelter costs, increasing transportation costs, and skewed income distribution, relatively few families will be able to purchase privately financed owner-occupied homes. If housing costs continue to increase at the 1967-1972 rate, it can be projected from the income data in Table 3.2 that about 30-35 percent of new dwelling units will be in this category.[8]

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[8]This percentage estimated by comparing %Δ in Income with %Δ in the price of housing, taking the difference, and then calculating % of families who could have afforded to buy a house, if it had cost that much more.

A recent study (Copelin and Associates, 1975: 22) projects an even more dismal view. It reports that 65.1 percent of all new dwelling units (including rentals) will require some form of direct federal subsidy. Of this total subsidized housing, 33 percent will be single-family, owner-occupied.

When combined, privately financed single family units combined with subsidized units could make up between 50 percent and 55 percent of total dwelling units. However, land use restrictions and increased transportation costs may cause this figure to be unrealistically high. A later section explores the relationship between available land and transportation costs as that relationship can be expected to influence density of housing in New Orleans in the projected time frame.

SCENARIO I: HIGHER DENSITY DEVELOPMENT ON AVAILABLE PRIME LAND

More available land implies, generally, a lower density in new residential construction. Likewise, lower per mile transportation costs (including time costs) imply lower density. Again, higher incomes and relatively more even income distributions imply more lower density developments. For the New Orleans SMSA, the converse of each of these has been shown to be more applicable.

Even if it is assumed that the ratio of single family dwellings to multi-family units will approach the national average for new increments of housing, it is safe to assume that most of these will be "satisficing" rather than "optimizing" units. In general, they will be constructed on smaller lots and they will be surrounded by less public green space. Prototypical examples of the type of moderate income housing which is likely to be federally subsidized is found in the University City area of Kenner. These Section 235 units are built on lots which are 50 x 120 feet (Kennedy, 1976). This allows 7.25 units per housing acre, or when 33 percent more land is added for roads, right of ways, neighborhood green areas, etc., about 5.5 units per total residential acre may be built. Many wealthier home purchasers (and building contractors) in the New Orleans area have also opted for very small lots. On the East Bank of Jefferson Parish it is not unusual to see a $75,000 house on a minimally legal one-eighth acre lot (Jefferson Parish Council, 1972: 433).

The reason behind such high density single family development is, of course, land price. Much of the currently developed area of the city was originally wetlands, as is much of the surrounding area. The cost of improving this land is high; the price of desirable property is understandably quite expensive. Increased construction, maintenance and flood insurance costs may add as much as $6000 (1974 dollars) per dwelling unit to the effective price of housing (Mumphrey and Waterman, 1976). Some of these considerations do not add directly to the price of land, but they certainly influence density by reducing the effective housing budget of the prospective home purchaser.

Scenario I (outlined in the following tables) is a simplified expression of one possible equilibrium of the housing market in 1980 and 1985. Each parish, it is assumed, increases in population in accordance with the Segal (1976) projections. This scenario implicitly recognizes the probable increase in land prices caused by the total SMSA change in population and land scarcity and translates these into increases in density.

Note that the intensity ratio for the residential increment is significantly higher than the average existing density computed using the SPO-LUDA[9] study. In this scenario, the ratio of single family to multi-family homes is maintained at 55 percent - 45 percent in each of the parishes on the south side of Lake Pontchartrain. Planning densities used for projection of residential land needs were 5.3 single family units per acre and 15 multi-family units per acre, including infrastructure and open space. These dwelling unit densities are relatively high (they imply approximately thirty-eight persons per housing acre), but are consistent with Planned Unit Development and New Town densities (Smolkin-Bost-Miestchovich, 1975). The exceptionally high cost of transport and the relatively large amount of prime land change the density pattern for St. Tammany Parish. Low income wage earners, who work in central city

[9]This study was done by the State Planning Office to provide them with a method for computing land use densities. See State Planning Office (1975) Land Use and Data Analysis Program. Baton Rouge, Louisiana: State Planning Office.

SCENARIO I: LAND REQUIREMENTS TO HOUSE "EXPECTED" POPULATION, BY PARISH

JEFFERSON PARISH

Land Use Category	1972 Intensity Ratio (Acres/User)	1972 Land in Use Acres	1980 Intensity Ratio (Acres/User)	1980 Land Required Acres	1985 Intensity Ratio (Acres/User)	1985 Land Required Acres
Urban and Built Up Land		44683		50022		53627
(11) Residential and (17) Strip and Cluster	.286	30134	.104	34594	.104	37655
(12) Commercial and Service and (16) Institutional	.038	3458	.038	4320	.038	4864
(13) Industrial	.145	5434	.145	5434	.145	5434
(15) Transportation, Communication and Utilities	.122	1729	.122	1774	.122	1774
(19) Open and Other		5928		3900		3900
(21-24) Agricultural Land		3705		3339		--
(41-43) Forest Land		3705		--		--
(51-55) Water Features		363337		363337		363337
Wetlands		107692		107692		107426
(61) Forested Wetlands		26429		26429		26163
(62) Non-Forested Wetlands		81263		81263		81263
(71-75) Barren Land		14573		14573		14573
(14) Extractive		44707		44707		44707
TOTAL AREA		584402		584402		584402

SCENARIO I: LAND REQUIREMENTS TO HOUSE "EXPECTED" POPULATION, BY PARISH

ORLEANS PARISH

Land Use Category	1972 Intensity Ratio (Acres/User)	1972 Land in Use Acres	1980 Intensity Ratio (Acres/User)	1980 Land Required Acres	1985 Intensity Ratio (Acres/User)	1985 Land Required Acres
Urban and Built Up Land		44707		46203		48186
(11) Residential and (17) Strip and Cluster	.139	27664	.104	29012	.104	30296
(12) Commercial and Service and (16) Institutional	.038	4446	.038	5554	.034	6253
(13) Industrial	.145	4940	.145	4940	.145	4940
(15) Transportation, Communications and Utilities	.122	2717	.122	2787	.122	2787
(19) Open and Other		4940		3910		3910
(21-24) Agricultural Land		247		247		247
(41-43) Forest Land		5681		4185		2202
(51-55) Water Features		97812		97812		97812
Wetlands		64961		64961		64961
(61) Forested Wetlands		6669		6669		6669
		58292		59292		58292
(71-75) Barren Land		741		741		741
(14) Extractive		988		988		988
TOTAL AREA		215137		215137		215137

SCENARIO I: LAND REQUIREMENTS TO HOUSE "EXPECTED" POPULATION, BY PARISH

ST. BERNARD PARISH

	1972		1980		1985	
Land Use Category	Intensity Ratio (Acres/User)	Land in Use Acres	Intensity Ratio (Acres/User)	Land Required Acres	Intensity Ratio (Acres/User)	Land Required Acres
Urban and Built Up Land		7410		8586		9004
(11) Residential and (17) Strip and Cluster	.498	6422	.104	6956	.104	7322
(12) Commercial and Service and (16) Institutional	.038	247	.038	329	.038	381
(13) Industrial	.145	741	.145	741	.145	741
(15) Transportation, Communication and Utilities		--		--		--
(19) Open and Other		741		560		560
(21-24) Agricultural Land		2470		2470		2470
(41-43) Forest Land		10374		9198		8760
(51-55) Water Features		1212770		1212770		1212770
Wetlands		265525		265525		265525
(61) Forested Wetlands		4199		4199		4199
(62) Non-Forested Wetlands		261326		261326		261326
(71-75) Barren Land		27911		27911		27911
(14) Extractive		--		--		--
TOTAL AREA		1527201		1527201		1527201

SCENARIO I: LAND REQUIREMENTS TO HOUSE "EXPECTED" POPULATION, BY PARISH

ST. TAMMANY PARISH

Land Use Category	1972 Intensity Ratio (Acres/User)	1972 Land in Use Acres	1980 Intensity Ratio (Acres/User)	1980 Land Required Acres	1985 Intensity Ratio (Acres/User)	1985 Land Required Acres
Urban and Built Up Land		31122		33575		34251
(11) Residential and (17) Strip and Cluster	1.36	26182	.333	28658	.333	30331
(12) Commercial and Service and (16) Institutional	.038	1729	.038	2303	.038	2666
(13) Industrial	.145	494	.145	494	.145	494
(15) Transportation, Communication, and Utilities	.122	741	.122	760	.122	760
(19) Open and Other		1976		680		680
(21-24) Agricultural Land		94107		94107		94107
(41-43) Forest Land		249717		247264		245908
(51-55) Water Features		149435		149435		149435
Wetlands		179322		179322		179322
(61) Forested Wetlands		122265		122265		122265
(62) Non-Forested Wetlands		57057		57057		57057
(71-75) Barren Land		--		--		--
(14) Extractive		2223		2223		2223
TOTAL LAND		705926		705926		705926

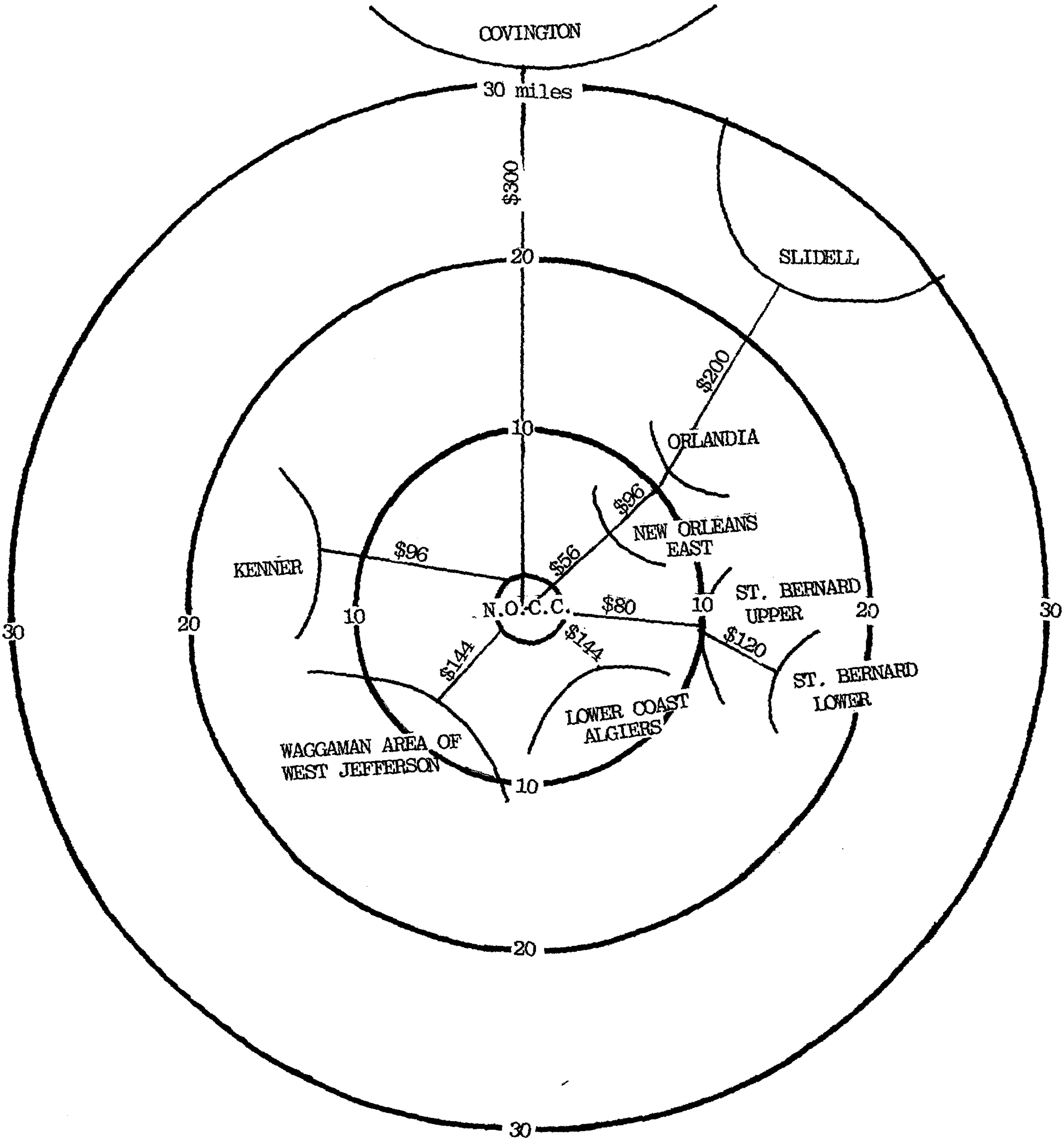
are in general not able to compete for this land simply because of the journey-to-work costs. Therefore, the more affluent will make up most of the population increase in that parish. They will most probably opt for single family homes on larger tracts. In St. Tammany Parish, the projected density in this scenario is about four families per housing acre.

Population Distribution Without Wetlands Reclamation: Evaluation of Scenario I

Scenario I, in the previous section, delineates one possible allocation of economic activity and housing for the expected population of the New Orleans SMSA in 1980 and 1985. This scenario follows the previous trends of population growth by parish. It shows that with substantial increases in residential density (which might be expected when land, housing and transportation costs are increasing faster than income), each parish could house its projected increase on available prime land.

It might appear that the additional construction costs would cause the reclamation of land to be far too expensive as a large scale solution to the land shortage. However, they must be traded off against either increased transportation costs or the somewhat less measurable costs of increased density. Figure 3.2 is a schematic of direct journey to work costs per month (for a single individual in a typical automobile) from various areas of the SMSA. The

FIGURE 3.2; APPROXIMATE DISTANCE AND MONTHLY COMMUTING COSTS AVAILABLE LAND AREAS NOSMSA



Source: Derived by Authors. See text.

method of calculation is shown in the legend. Table 3.9 shows the capitalized present values of those costs.

An attempt is made in Figure 3.2 and Table 3.9 to show some of the additional costs of congestion. Access from possible residential areas has been measured along existing corridors to a point in the central city near the Superdome. At peak traffic hours, all major highways leading to the central city are operating above capacity and traffic is slowed perceptibly. Hence, all costs shown are below the journey-to-work costs as perceived by drivers using these roads at this time. These generalized costs of congestion are not here considered, but the extra time costs to Westbank residents created by the paucity of bridges over the Mississippi are significant and must be taken into account. One report (Kaiser Engineers, 1974) estimates this time differential to be about 15 minutes for the Lower Coast of Algiers. Table 3.9 adjusts the monthly journey to work costs for areas on the Southside of the River using this differential transformed into "equivalent" miles which could be traveled in that quarter-hour.

While Scenario I seems realistic in the sense that higher densities seem ordained by the economic considerations, it ignores the accessibility costs of intensive development on the Westbank of the Mississippi in both Jefferson and Orleans Parishes. If no wetlands reclamation was allowed (where wetlands include all areas as shown on the 1975 SPO-LUDA map), the area of primarily forest and agricultural land

TABLE 3.9

MONTHLY AND CAPITALIZED PRESENT VALUE OF TRANSPORTATION COSTS VERSUS PRIVATE LAND RECLAIMATION COST

AREA OF SMSA	MONTHLY[1] COMMUTING COSTS	CAPITALIZED PRESENT VALUE i = 6%; n = ∞	PRESENT VALUE OF PRIVATE COST OF LAND RECLAIMATION	PRESENT VALUE TOTALS FOR ALL AREAS OF AVAILABLE LAND	DIFFERENTIAL TOTALS: LOWEST COST ALTERNATIVE SUBTRACTED OUT	DESIRABILITY BY RANK, GIVEN COST CONSIDERA-TIONS ONLY
Covington area	$300	$60,000	-	$60,000	$47,500	7
Slidell area	200	40,000	-	40,000	27,500	7
Orlandia area	96	19,200	$6,000[2]	25,200	12,700	5
Eastern New Orleans	56	11,200	1,300[2]	12,500	0	1
St. Bernard above Violet	80	16,000	-	16,000	3,500	2
St. Bernard below Violet	120	24,000	-	24,000	11,500	4
Lower Coast of Algiers	144	28,800[3]	-	28,800	16,300	6
Waggaman area	144	28,800[3]	-	28,800	16,300	6
Kenner area	96	19,200	-	19,200	6,700	3

Source: Derived by authors.

[1]Commuting Costs are for 20 journey to work round trips. Costs figured at 20¢/mile plus current tolls.

[2]Per dwelling unit. Eastern New Orleans figure is for price of fill only (from Mumphrey, et al., 1975).

[3]Monthly cost adjustment ($48) calculated from: Adjusted in miles = time difference x average miles/hr. I-10 peak
Adjusted in Dollars = adjusted in miles x cost/mile/month

where: time difference = .25 hours
average miles/hr. = 24 mph

in West Jefferson from the Parish Line to Avondale (referred to in Table 3.9 as the Waggaman area) and the similar area in what is known as Lower Algiers in Orleans Parish would possibly develop in such a manner. More probably (it is felt) a spillover of residential population would occur in St. Bernard and the east bank of St. Charles Parishes simply due to the better accessibility of these areas.

A clearer understanding of the accessibility problem can be gained from Figure 3.3. This figure shows the main areas of available prime land in 1972 in the three SMSA parishes on the southside of Lake Pontchartrain.[10] Much of the land which was vacant in East Jefferson in 1972 (e.g., the University City area in Kenner) is now fully developed with single family housing. The effect (as the map clearly indicates) is this: much of the multi-family housing projected for Jefferson and, to a lesser extent, Orleans for 1980 and 1985 would have to be built on the Westbank.

The housing "slump" of the last three years somewhat clouds the picture because very little multi-family housing has been built at all (Siegel and Associates, 1976). Multi-family housing has not proven consistently successful on the Westbank, nor would one expect it to. It is

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[10] There are, of course, minor tracts within the existing developed areas which might be developed more intensively. The total quantity of vacant land of this nature in Orleans Parish does not appear to exceed 10%, and in Jefferson probably does not exceed 15% of the necessary land to house the expected 1980 population. Much of this land which does exist is being held for speculation or is not otherwise available for residential use.

unusual for higher density housing to compete with single family homes. Most often this housing is found in areas which maximize access to urban amenities and minimize transportation costs.

If only 45% of the additional households expected in Jefferson by 1980 were multi-family and if even 50 percent of these were built on the Westbank, then 10,000 new dwelling units would be needed. By 1985, the figure would be over 16,000 new multi-family units. This projection would imply that either much of the increment in jobs would have to occur on the Westbank or that congestion and total transport costs would rise percipitously because of the lack of bridges.

It is more reasonable to project that more accessible areas will develop more intensely and that those large tracts on the Westbank will see slower and more traditionally suburban development. One factor which will make this possible is that large tracts of open land (which are shown in wetlands in the SPO-LUDA study, but which have in fact long been impounded and drained) exist in the area of Eastern New Orleans between Downman Road and Paris Road and between Lake Pontchartrain and U.S. 90. This area contains the most accessible open land in the SMSA and, because it is no longer considered as viable wetlands (Mumphrey et al., 1975), it will most likely be permitted to develop. The added costs to home purchasers or developers will likely be primarily land fill, at an estimated $1,300 per dwelling unit (Mumphrey et al., 1975).

SCENARIO II: THE PROBABLE DISTRIBUTION OF POPULATION AND ECONOMIC ACTIVITY, 1980, 1985

Scenario II attempts to project a more realistic distribution of population within the New Orleans SMSA for 1980 and 1985. The distribution of economic activities in this scenario is unchanged. However, the population growth rate in Jefferson Parish has been reduced by 33 percent to reflect the scarcity of accessible land for development in that parish. This population is shifted on the basis of 75 percent to Orleans, 12.5 percent to St. Tammany, and 12.5 percent to St. Bernard. All of the shift in population to Orleans is assumed to be of the multi-family housing segment. Hence, 75 percent of the 33 percent has been added to the Orleans Parish multi-family housing market. And 12.5 percent of the 33 percent has been added to the single-family housing segment in St. Bernard and St. Tammany.[11]

One further consequence of the perceived Eastbank-Westbank differential in transportation cost has been the very rapid development of the Eastbank of Jefferson Parish. This has led to almost unplanned expansion of residential and commercial land uses. What little land is now left for development is priced extremely high. An unfortunate outcome of this is that there is little possibility of

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[11] These percentages are, of course, arbitrary, but they are not capricious. They are based on the author's judgment of the available land for high intensity development which remains in East Jefferson.

SCENARIO II: LAND REQUIREMENTS TO HOUSE "REALLOCATED" POPULATION, BY PARISH

JEFFERSON PARISH

	1972		1980		1985	
LAND USE CATEGORY	INTENSITY RATIO (ACRES/USER)	ACRES	INTENSITY RATIO (ACRES/USER)	ACRES	INTENSITY RATIO (ACRES/USER)	ACRES
Urban and Built Up Land		46683		48759		52456
(11) Residential and (17) Strip and Cluster	.286	30134	.16	34731	.16	37884
(12) Commercial and Service and (16) Institutional	.038	3458	.038	4320	.038	4864
(13) Industrial	.145	5434	.145	5434	.145	5434
(15) Transportation, Communication and Utilities	.122	1729	.122	1774	.122	1774
(19) Open and Other		5928		2500		2500
(21-24) Agricultural Land		3705		3705		1637
(41-43) Forest Land		3705		1629		--
(51-55) Water Features		363337		363337		363337
Wetlands		107692		107692		107692
(61) Forested Wetlands		26429		26429		26429
(62) Non-Forested Wetlands		81263		81263		81263
(71-75) Barren Land		14573		14573		14573
(14) Extractive		44707		44707		44707
TOTAL LAND		584402		584402		584402

SCENARIO II: LAND REQUIREMENTS TO HOUSE "REALLOCATED" POPULATION, BY PARISH

ORLEANS PARISH

LAND USE CATEGORY	1972 INTENSITY RATIO (ACRES/USER)	1972 ACRES	1980 INTENSITY RATIO (ACRES/USER)	1980 ACRES	1985 INTENSITY RATIO (ACRES/USER)	1985 ACRES
Urban and Built Up Land		44707		48014		51382
(11) Residential and (17) Strip and Cluster	.139	27664	.134	30823	.134	33492
(12) Commercial and Service and (16) Institutional	.038	4446	.038	5554	.038	6253
(13) Industrial	.145	4940	.145	4940	.145	4940
(15) Transportation, Communication and Utilities	.122	2717	.122	2787	.122	2787
(19) Open and Other		4940		3910		3910
(21-24) Agricultural Land		247		147		147
(41-43) Forest Land		5681		5681		5381
(51-55) Water Features		97812		97812		97812
Wetlands		64961		63436		61594
(61) Forested Wetlands		6669		5144		3302
(62) Non-Forested Wetlands		58292		58292		58292
(71-75 Barren Land		741		741		741
(14) Extractive		988		988		988
TOTAL LAND		215137		215137		215137

SCENARIO II: LAND REQUIREMENTS TO HOUSE "REALLOCATED" POPULATION, BY PARISH

ST. BERNARD PARISH

LAND USE CATEGORY	1972 INTENSITY RATIO (ACRES/USER)	1972 ACRES	1980 INTENSITY RATIO (ACRES/USER)	1980 ACRES	1985 INTENSITY RATIO (ACRES/USER)	1985 ACRES
Urban and Built Up Land		7410		9564		10659
(11) Residential and (17) Strip and Cluster	.498	6422	.22	7934	.22	8977
(12) Commercial and Service and (16) Institutional	.038	247	.038	329	.038	381
(13) Industrial	.145	741	.145	741	.145	741
(15) Transportation, Communication and Utilities		--		--		--
(19) Open and Other		741		560		560
(21-24) Agricultural Land		2470		2470		2470
(41-43) Forest Land		10374		8591		7758
(51-55) Water Features		1212770		1212770		1212770
Wetlands		265525		265525		265525
(61) Forested Wetlands		4199				
(62) Non-Forested Wetlands		261326				
(71-75) Barren Land		27911		27911		27911
(14) Extractive		--		--		--
TOTAL LAND		1527201		1527201		1527201

SCENARIO II: LAND REQUIREMENTS TO HOUSE "REALLOCATED" POPULATION, BY PARISH

ST. TAMMANY PARISH

LAND USE CATEGORY	1972 INTENSITY RATIO (ACRES/USER)	1972 ACRES	1980 INTENSITY RATIO (ACRES/USER)	1980 ACRES	1985 INTENSITY RATIO (ACRES/USER)	1985 ACRES
Urban and Built Up Land		31122		32988		35128
(11) Residential and (17) Strip and Cluster	.36	26182	.28	28751	.28	30528
(12) Commercial and Service and (16) Institutional	.038	1729	.038	2303	.038	2666
(13) Industrial	.145	494	.145	494	.145	494
(15) Transportation, Communication and Utilities	.122	741	.122	760	.122	760
(19) Open and Other		1976		680		680
(21-24) Agricultural Land		94107		94107		94107
(41-43) Forest Land		249717		247851		245711
(51-55) Water Features		149435		149435		149435
Wetlands		179322		179322		179322
(61) Forested Wetlands		122265		122265		122265
(62) Non-Forested Wetlands		57057		57057		57057
(71-75) Barren Land		--		--		--
(14) Extractive		2223		2223		2223
TOTAL LAND		705926		705926		705926

Jefferson Parish obtaining the quantity of urban recreational land (shown as "open and other" in Scenario I) recommended by the Louisiana State Parks and Recreation Commission (1974). Scenario II adjusts the 1980 and 1985 recreation space for Jefferson to a more realistic figure by reducing this category.

Evaluation of Land Use Projections: Scenario II

Scenario II indicates a much different distribution of population than that in Scenario I. In Scenario I, there would be no development of wetlands, but there would be intensive development on the Westbank of the River. Scenario II, on the other hand, projects much development on previously relaimed wetlands in eastern New Orleans and a significant shift of population away from the Westbank of Jefferson and Orleans.

In evaluating this second scenario, it is appropriate to restate the factors of economic and demographic change which could affect the density and allocation of increments in population and economic activity. A partial listing of these factors includes:

1) the kind, amount and location of employment generators;
2) land prices and housing costs;
3) accessibility of developable areas and the transportation system;
4) family size and household generation;
5) political regulation of development.

Factors two and three have been extensively considered in this chapter and, in fact, have led to the land use projections in both scenarios. In Scenario I, factor two was emphasized to show that the increasing densities which may be expected from higher land prices and housing costs could effectively lead to a situation in which the expected population could be housed on available prime land. In analysis of Scenario I, it was suggested that the additional transportation costs involved with intensive development of the Westbank might, in the absence of regulation, lead instead to more rapid development of eastern New Orleans as an alternative. Scenario II thus emphasizes factor three in its projection of residential land use.

While indicative of a range of alternatives with regard to population distribution, neither of these two scenarios has been shown to be an equilibrium position for the allocation of housing or economic activities. An understanding of the probable distribution of employment (Factor 1) will be useful in determining the equilibrium pattern of settlement. Contributing further to the determination of equilibrium will be an analysis of the type of housing desired by population increments. Factor four must therefore be considered.

Factor five can "distort" or modify the equilibrium determined by factors one through four in both passive and active ways. Simply, passive intervention is used here to mean an overall or general attitudinal or legalistic climate for particular types of development. Active intervention refers here to specific promotion, or prohibition, of any activity.

Factor 1: Throughout this study, access to the Central Business District (CBD) has been consdiered a major determining factor in the allocation of residential land. The validity of this measure is, of course, dependent upon the distribution of new jobs within the SMSA. Table 3.3 yields an insight into the distribution of employment through analysis of the types of new jobs expected. It can be seen from this table that retail employment, wholesale employment, service and financial sector employment and government employment will lead the fields of growth. Each of these has traditionally been a major function of the Central Business District, and with the exception of retail employment, has shown strong concentration in this area of the city. There has been a tendency in recent years for each of these employment sectors to disperse somewhat, but until recently, only wholesale trade employment has shown a tendency to cluster in areas outside of the CBD (e.g., along Jefferson Highway and Edwards Avenue in Jefferson Parish).

Three new "satellite" business districts, however, have begun to develop and a fourth is almost certain. Of these, the most clearly obvious area is found along Causeway Boulevard in Metairie. The primary generator for this area was originally the Lakeside Shopping Center, itself a major employer in retail trade. But the "Fat City" CBD, as it has come to be known, now includes such diversified functions as employment agencies, insurance firms, banks, travel agencies, government offices and, perhaps most importantly, a city-wide entertainment district. It is not felt that this area will seriously challenge the main CBD for basic employment in the near future, but it will undoubtedly continue to grow in importance with regard to city-serving functions.

The Oakwood Mall area on the Westbank has also come into some prominence as a satellite center. Because of the geographic barrier posed by the River, this center primarily serves Westbank residents; for them it serves many, if not most, of the traditional service functions of the central business district. Because of its proximity to the Harvey Industrial Canal and other Westbank industrial locations, this general area (which stretches along the Westbank Expressway and General DeGaulle Drive) contains offices and service facilities for many basic and city-wide employers. The growth of this center is largely dependent upon its accessibility, which will be improved with the new Mississippi River Bridge. The completion of that link, however, will not significantly affect the distribution of employment within the projection period, since it is not scheduled before 1982.

The Plaza Regional Shopping Center is the newest of the satellite CBD's in the SMSA; in fact, it is not clear that it has yet achieved that status. The development of this center is reasonably certain, however, given any further expansion of housing in eastern New Orleans and its location relative to Orlandia. Auxillary development proximate to the shopping center has already begun.

Only slightly less certain is the development of a full service center in Chalmette or elsewhere in St. Bernard Parish. There is as yet no clear core around which such a growth center has focused and lineal developments (such as that dictated by the geography of the prime land in the parish) have traditionally been slow to develop such a core. But the expected increase in petroleum refining capacity in the parish and other developments associated with Superport (see Table 3.3), as well as the rapid increase in population would seem to indicate at least the beginning of such a center before 1985.

Taken together, these satellite centers can be expected to drain a respectable amount of the increases in employment away from the main CBD. If it were not for the apparent revitalization of the older core through employment generated by the Superdome and other central city developments, the use of CBD as a prime access focal point might be questionable. It seems clear, however, that these developments will, in sum, outweigh the effects of growth in other areas.

Because the CBD is expected to remain strong and because the commercial and service growth in the Plaza area should at least balance that in Metairie, it is felt that allocation of economic activity between parishes using existing-share ratios is appropriate.[12] Figures using this method are the same for both Scenarios I and II. With regard to the distribution of the residential land increment, the foregoing discussion suggests that Scenario II more accurately fits the expected relationship between place of residence and place of work since it yields significantly lower total transportation costs.

Factor 4: Families seeking new housing locate not only with respect to employment, but also with concern for neighborhoods, schools, shopping, entertainment and other urban services. Because this factor is so complex, it is difficult to use it to project the type and location of desired housing. However, to assume that past trends and previously revealed preferences will prevail can also be misleading. Factor 4 is used simply to indicate some of the marginal changes which may take place in this time frame.

Certain emerging trends have become important enough recently to indicate that the massive outmigration of the middle class to the suburbs may be tapering off. One indication of this is the renewed interest by middle class families in the central city housing stock. Renovation of older homes may cause a reversal of the tendency of the

[12] St. Tammany Parish has not been explicity considered in this analysis because, despite its rapid growth, it is unlikely to develop much more than local service employment in the next ten years due to its geographic location.

older areas toward blight, which, in the long run, could lead to a much healthier urban core. If this occurs, there should be less of a tendency towards metropolitan spread because proximity to the central city might well be perceived as a "good" (i.e., as a positive externality of location). The location of more middle class families in the old city may have the effect of removing some of the working class nonrenovated housing from the rental segment of the market. As more of the older homes are renovated, some people could be pushed into the less locationally desirable rental housing on the outskirts of the central city. It is clear that, if this process develops as described, Scenario II is much more likely (and socially desirable) than Scenario I because in Scenario II more multi-family housing would be located in eastern New Orleans, resulting in transportation savings for those forced out of the old city.

The above description will, of course, affect only a small portion of the housing market directly. Many middle class home buyers will still be locating in suburbia. And many lower income people would, by preference, choose to live in the fringe of the city (given reasonable transportation) in any case. The fact that the central city is attracting more of the relatively affluent also has an indirect implication, however, about the preferences of at least certain households with regard to schools and urban services. A primary reason for believing that this recent trend is indicative of other changes in preference lies in the changing nature of the household. Families are becoming smaller, and, as mentioned in an earlier section, the ratio of working age population to total population is increasing. When the projected rate of growth of households (2.8 percent annually) is compared to the rate of growth in population (1.3 percent annually) (Segal, 1976: 78-79), it is clear that more households will have fewer children and will, therefore, logically require smaller hosing units. This argument is not meant to imply that most people still would not prefer to own their own homes, only that the size of the desired house and lot may well be smaller than in recent years. Since fewer children are likely to be entering school, the suburban parishes may lose some of their attractiveness. A more numerous adult population may also prefer to have access to urban entertainment and shopping. Once again, Scenario II seems a logical allocation of population, both between and within the parishes.

Factor 5: In the time frame under consideration in this study, all of the population increment could be housed on available prime land as shown in Scenario I. One purpose of developing this Scenario was to show a possible effect of political regulation of wetlands development. If no development was allowed in any of the areas shown as wetlands on the SPO-LUDA base map (1972), then it might be considered that some allocation of population like that in Scenario I was "rational". However, as this section and others have shown, such an allocation would involve greater total transportation costs and very probably greater densities.

Since an optimal allocation of population must be one which maximizes net social benefits, it would appear that the decision to regulate or not should depend upon measuring the total costs of wetland development in eastern New Orleans against the benefits derived therefrom. Such a study is, of course, not within the scope of this chapter.

When an acre of wetland is part of a viable estuarine system, it has a value far beyond that which it has in isolation (see Mumphrey et al., 1975: 96-137). Once that land has been impounded, its environmental value diminishes greatly. The areas which have been projected for development in this study fall into this latter category. All of the land necessary for development in New Orleans in the forseeable future has been leveed; much of it has been drained. Apparently, the environmental damage has been done: the further ecological costs will probably not be great.[12]

Any active political intervention is likely to be in favor of development as the New Orleans City Planning Commission, the City Council, and the Mayor's Office have given full support to the development of certain areas in eastern New Orleans, and particularly to Orlandia (City

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[12]However, continuing public opposition to projects such as Orlandia may be expected.

Planning Commission, 1975). It should not be necessary to develop any other wetland areas before 1985 since only in Jefferson would the population pressure sustain the private costs of development. In Jefferson, however, the wetlands are to a great extent, on the Westbank of the River and hence, suffer from the same access problem encountered by the prime land.

This section has shown that from an economic standpoint, with respect to the location of jobs, from a social standpoint, with respect to changing preferences in housing, and from an environmental standpoint, Scenario II is a rational allocation of residential population and economic activity.

The following section concludes the substantive portion of the chapter with a discussion of the allocation of economic activity and housing within each parish.

NOTES ON THE INTRAPARISH DISTRIBUTION POPULATION AND ECONOMIC ACTIVITY: AN INTERPRETATION UNDER SCENARIO II

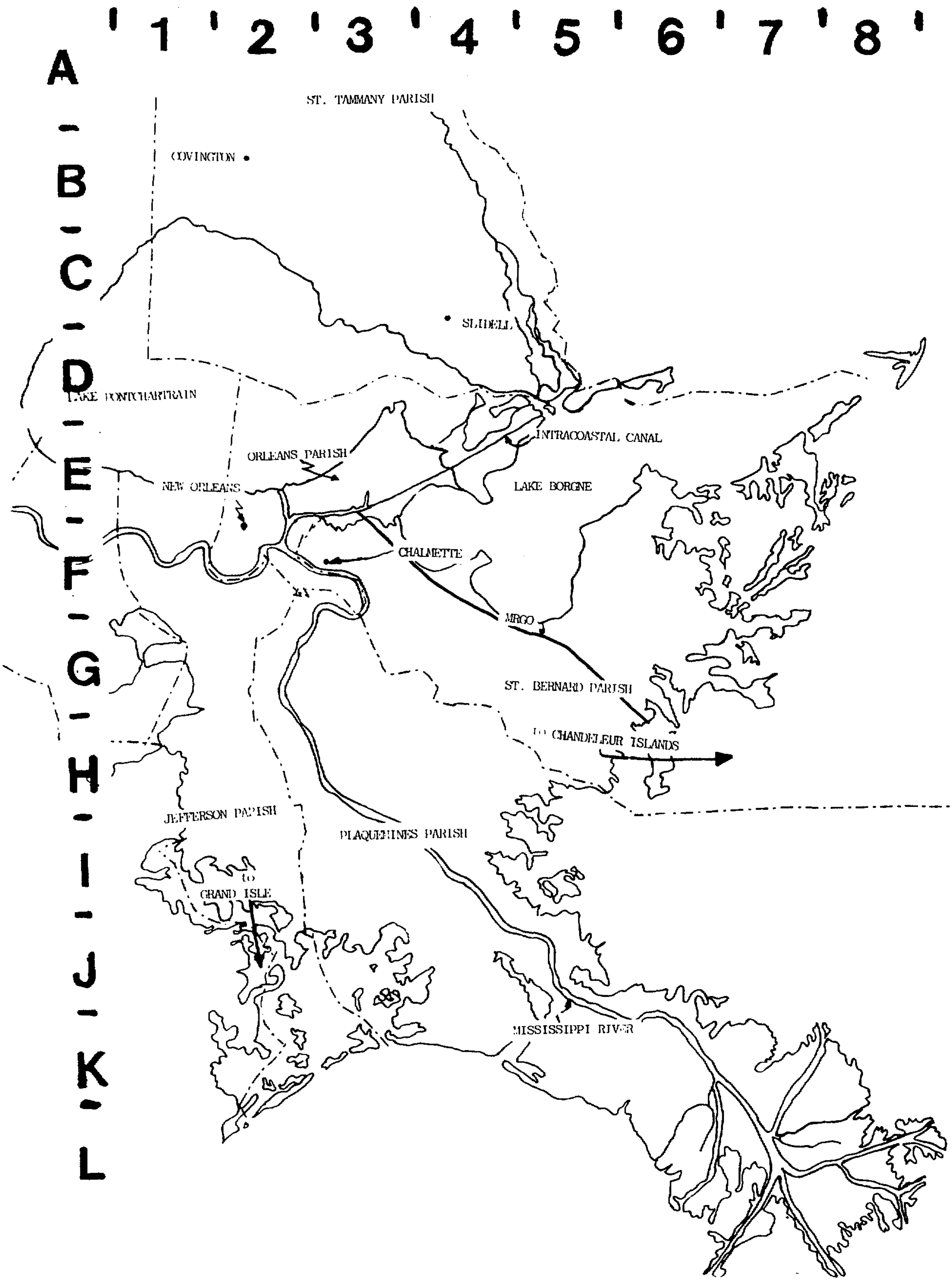
This section contains a verbal description of the kind, amount, and specific location of economic activity and housing which each parish (under the assumptions of Scenario II) is projected to receive by 1985. This allocation is, of course, only an estimate. It is based on available land, accessibility, previous settlement patterns and the authors' judgments. The verbal descriptions are followed by a set of locational matrices by type of land use and by area within each parish. These matrices (Table 3.10) are keyed to the grid system on Figure 3.3.

Jefferson Parish may still expect very substantial growth through 1985. The adjusted projection, based on Scenario II, is an increase of 28,733 households from 1972 to 1980 and an additional increase of 19,725 households by 1985 (Table 3.11). Approximately 7,000 additional acres will be required for housing from 1972 until 1985.

In the period from 1972 to 1976, most of the growth in residential housing has been in East Jefferson, primarily in the city of Kenner. This area (of approximately 2,200 acres) has developed largely in smaller single family homes. Since the density of this housing is relatively high, the area provides space for about 12,000 post-1972 dwelling units. By 1980, all of the vacant land in and around Kenner should be fully developed.

There are approximately 7,000 acres of developable prime land on the Westbank of Jefferson Parish. As noted, most of this land (over 5,000 acres) is in the upstream portion of the parish near the St. Charles boundary. The remainder is scattered throughout the southern portion of the parish and is predominantly in agricultural use. All of the forest land near Avondale and most of the farm land in this area may be expected to develop in low density housing before 1985. There will at that time be few, if

FIGURE 3.3; NEW ORLEANS SMSA, AREA KEYS



Source; U.S. Army Corps of Engineers, 1973.

TABLE 3.10

DISTRIBUTION OF NEW INCREMENTS OF LAND USE BY TYPE WITHIN EACH PARISH, 1980-1985

JEFFERSON PARISH

LOCATION OF DEVELOPMENT: FIGURE 3.4 AREA KEY	LOCATION OF DEVELOPMENT: AREA OF PARISH	TYPE "OF DEVELOPMENT" (ACRES): RESIDENTIAL & STRIP CLUSTER	TYPE "OF DEVELOPMENT" (ACRES): COMMERCIAL, SERVICE & INSTITUTIONAL	TYPE "OF DEVELOPMENT" (ACRES): TRANSPORTATION, COMMUNICATION & UTILITIES	TYPE "OF DEVELOPMENT" (ACRES): TOTAL NEW DEVELOPMENT	TYPE OF LAND DEVELOPED[1]: PRIME	TYPE OF LAND DEVELOPED[1]: SPO-LUDA WETLANDS
			1980				
E-1	Kenner	2250	210	--	2460	2460	--
F-1	Elmwood	200	216	45	461	361	100
F-1	Avondale	1547	245	--	1792	1792	--
	Other Jefferson	600	191	--	791	591	200
	Total Jefferson	4597	862	45	5504	5204	300
			1985				
E-1	Kenner	--	--	--	--	--	--
F-1	Elmwood	200	200	--	400	400	--
F-1	Avondale	2533	250	--	2783	2783	--
	Other Jefferson	420	94	--	514	514	--
	Total Jefferson	3153	544	--	3697	3697	--

Source: Derived by Authors from Scenario II. See text.

[1] Includes only areas which have been previously impounded.

TABLE 3.10

DISTRIBUTION OF NEW INCREMENTS OF LAND USE BY TYPE WITHIN EACH PARISH, 1980-1985

ORLEANS PARISH

LOCATION OF DEVELOPMENT		TYPE "OF DEVELOPMENT" (ACRES)				TYPE OF LAND DEVELOPED	
FIGURE 3.4 AREA KEY	AREA OF PARISH	RESIDENTIAL & STRIP CLUSTER	COMMERCIAL, SERVICE & INSTITUTIONAL	TRANSPORTATION, COMMUNICATION & UTILITIES	TOTAL NEW DEVELOPMENT	PRIME	SPO-LUDA[1] WETLANDS
			1980				
E-3	Orlandia	1190	248	--	1438	--	1438
E-2	East. New Orleans	1769	610	70	2449	--	2449
F-2	Algiers	200	150	--	350	350	--
F-3	Lower Algiers	--	--	--	--	--	--
	Other Orleans	--	100	--	100	100	--
	Total Orleans	3159	1108	70	4337	450	3887
			1985				
E-3	Orlandia	1443	301	--	1744	--	1744
E-2	East. New Orleans	826	285	--	1111	--	1111
F-2	Algiers	150	63	--	213	213	--
F-3	Lower Algiers	250	50	--	300	300	--
	Other Orleans	--	--	--	--	--	--
	Total Orleans	2669	699	--	3368	513	2855

Source: Derived by Authors from Scenario II. See text.

[1]Includes only areas which have been previously impounded.

TABLE 3.10

DISTRIBUTION OF NEW INCREMENTS OF LAND USE BY TYPE WITHIN EACH PARISH, 1980-1985

ST. BERNARD PARISH

LOCATION OF DEVELOPMENT		TYPE "OF DEVELOPMENT" (ACRES)				TYPE OF LAND DEVELOPED	
FIGURE 3.4 AREA KEY	AREA OF PARISH	RESIDENTIAL & STRIP CLUSTER	COMMERCIAL, SERVICE & INSTITUTIONAL	TRANSPORTATION, COMMUNICATION & UTILITIES	TOTAL NEW DEVELOPMENT	PRIME	SPO-LUDA WETLANDS
			1980				
F-3	Above Violet	1212	66	--	1278	1278	--
F-4	Below Violet	300	16	--	316	316	--
	Total St. Bernard	1512	82	--	1594	1594	--
			1985				
F-3	Above Violet	650	35	--	685	685	--
F-4	Below Violet	393	17	--	410	410	--
	Total St. Bernard	1043	52	--	1095	1095	--

Source: Derived by Authors from Scenario II. See text.

TABLE 3.10

DISTRIBUTION OF NEW INCREMENTS OF LAND USE BY TYPE WITHIN EACH PARISH, 1980-1985

ST. TAMMANY PARISH

LOCATION OF DEVELOPMENT		TYPE "OF DEVELOPMENT" (ACRES)				TYPE OF LAND DEVELOPED	
FIGURE 3.4 AREA KEY	AREA OF PARISH	RESIDENTIAL & STRIP CLUSTER	COMMERCIAL, SERVICE & INSTITUTIONAL	TRANSPORTATION, COMMUNICATION & UTILITIES	TOTAL NEW DEVELOPMENT	PRIME	SPO-LUDA WETLANDS
			1980				
B-2	Covington	645	150	19	814	814	--
C-3	Lacombe	538	100	--	638	638	--
D-4	Slidell	782	174	--	956	956	--
	Other St. Tammany	604	150	--	754	754	--
	Total St. Tammany	2569	574	19	3162	3162	--
			1985				
B-2	Covington	446	127	--	573	573	--
C-3	Lacombe	372	65	--	437	437	--
D-4	Slidell	541	81	--	622	622	--
	Other St. Tammany	418	90	--	508	508	--
	Total St. Tammany	1777	363	--	2140	2140	--

Source: Derived by Authors from Scenario II. See text.

TABLE 3.11

REALLOCATED POPULATION BASED ON AVAILABILITY OF LAND

HOUSEHOLDS	SEGAL 1972	SEGAL 1980	MODIFIED 1980	SEGAL 1985	MODIFIED 1985	SEGAL % Δ		MODIFIED % Δ	
PARISH						1972 1980	1972 1985	1972 1980	1972 1985
Jefferson	105000	147885	133733	177325	153458	41	69	27	46
Orleans	197900	210863	221477	223209	241109	6.5	13	12	22
St. Bernard	14900	20007	21776	23531	26514	34	58	46	78
St. Tammany	19200	26605	28374	31628	34612	39	65	48	80
NOSMSA	337000	405360	405360	455693	455693	20	35	20	35

Sources: Original population figures from Segal (1976). Projections modified by reducing Jefferson Parish growth by 33% on the basis of available land. Of this difference 75% is allocated to Orleans and 12.5% is allocated to each of the other parishes. This allocation reflects the rank order of growth as shown in the recent special censuses (Tri-S, 1976).

any, large tracts of prime land left for development in the Westbank of the parish.

A certain amount of commercial development, primarily local-service activity, can also be expected in the area upstream of Avondale. Other economic activity on the Westbank will probably be in the few remaining developable tracts along the Barataria corridor. In total, approximatley 500 acres of new economic activity can conservatively be projected for the Jefferson Parish Westbank.

On the Eastbank of Jefferson, most of the commercial and service activity will probably locate in the recently opened area between Airline and Jefferson Highways known as Elmwood. This area, between Clearview Parkway on the east and Hickory Avenue on the west, contains approximately 1300 acres of which over 800 acres are shown as vacant in 1972. It may be expected that retail and wholesale trade, transportation, and multi-family housing will totally fill this area by 1985.

Scenario II projects 2,500 acres of "open and other" category land in 1980 and 1985. Of this total, 440 was already in urban recreation use in 1972. Another 170 acre park was added in 1975; this area will likely be the only addition to Eastbank recreation land before 1980 (Terranova, 1976). There are, however, plans for lineal parks along the Lakefront; and the possibility exists for batture area recreation development near Harahan before 1985. A generous estimate of total recreational urban areas in Jefferson by the end of the projection period is around 1,000 acres. The remaining 1,500 acres of "open and other land" will be split between land held for speculation, cemetaries, and land which is in transition from one use to another.

In summary, the Eastbank of Jefferson Parish will be fully developed and essentially unable to absorb further population increases after 1980. By 1985, prime developable land on the Westbank will be scarce. Commercial and industrial activity will be distributed along corridors on both sides of the River. Urban park space, particularly on the Eastbank, will be in short supply with little land available to make up the difference.

Orleans Parish has been projected to decline slightly in total population through 1985 (Segal, 1976: 152). Scenario II shows this to be unlikely. New growth, much of it derived from the land scarcity in Jefferson Parish, will easily outweight the out-migration. Most of the new growth will in all probability occur in the area east of the Industrial Canal. I-10 and U.S. 90 will be the main corridors around which this growth will focus. The new roads referred to in the transportation section will help open the area for residential and commercial development. With adequate mass transit in this area of the SMSA a likelihood, the expectation is for much of the new multi-family housing to be in the form of garden apartments clustered around these thoroughfares.

Single family housing will predominate further from the central city, particularly in Orlandia. The ratio of new single family to multi-family housing in Orleans Parish will be much lower than in the suburban parishes. In this area, a different mix of services will have to be provided. More light commercial in eastern New Orleans along with entertainment and various service activities will probably develop.

The Central Business District is likely to be the focus of many new jobs, although, of course, the land required for new developments will be transformed in use rather than added as a net increase to "urban and built up land". New increments of land will be required for the expansion of economic activity in other areas of the city. Several hundred acres around and including the Plaza Regional Shopping Center will be necessary. Wholesale trade, transportation and service activities will locate mostly in the area between the Mississippi River Gulf Outlet and Chef Menteur Highway (U.S. 90).

Recreational space in Orleans Parish is essentially adequate. With the addition of Joe Brown Park in 1975 (an area of over 300 acres), the new increments of population will probably have sufficient urban recreation facilities until 1985.

The Westbank of Orleans Parish will develop slowly at least through 1985. Not only is the Westbank in general difficult to access, but the available prime land lies mostly to the east of the Intracoastal Waterway (Lower Algiers) which is cut off even from Algiers by the lack of bridges over this channel. Probably no more than 300 acres of the 4,700 acres available will be developed by 1985 and this will be in large lot, suburban single family homes.

To summarize, New Orleans growth will lie predominantly to the east, with the area from Downman Road to Read Boulevard experiencing the greatest growth from 1972 to 1980 and with much of the growth after 1980 being centered in Orlandia (east of Paris Road to U.S. 11).

St. Bernard Parish had until recently, not developed very rapidly. The social, economic, and locational advantages which made Jefferson Parish a primary growth node during the 1960's and early 1970's were evidently not perceived to exist in St. Bernard. But this situation has changed recently, in part due to the scarcity of land in East Jefferson and in part due to a matrix of factors such as improved public education, better access routes and the growth of Kaiser Aluminum.

The parish is now undergoing very substantial growth. The prime land from the Orleans Parish line downriver to Chalmette is now fully developed. Most of the new development has been in single family housing and new increments are likely to continue this trend. Commercial interests are scattered along the St. Bernard Highway (Louisiana 46) and Judge Perez Drive. Major industrial plants are located primarily along the river and some space exists for expansion.

Between 1972 and 1985, at least 2,500 acres will be needed for housing and 130 more will be needed for commercial and service. There is plentiful prime land above the Violet Canal to supply this need. No reclamation should be necessary during the projection period.

St. Tammany Parish will continue to expand around existing nodes in Covington and Slidell. Further growth will most likely also occur along U.S. 190 between Slidell and Lacombe. The northern portion of the parish will remain primarily in agriculture and forests. Eastern St. Tammany wetlands should be protected from development by the availability of more suitable prime land.

The projected 4,000 acres of prime land projected for future development in St. Tammany is a very small percentage of the land available. If growth should double or even triple (which as shown is most unlikely), there is no reason to believe that any major effect on surrounding land uses would be felt.

APPENDIX 3.1

Definitions, Land Use Classification

DEFINITIONS

In the definitions presented here, an attempt has been made to include sufficient detail to provide a general understanding of what is included in each category at Levels I and II. Many of the uses described in detail will not be visible on spacecraft and high-altitude imagery. However, the detail will aid in the interpretation process, and the additional information will be useful to those who have large-scale aerial photographs and other supplemental information available.

01. Urban and Built-Up Land

Urban and Built-up Land comprises areas of intensive use with much of the land covered by structures. Included in this category are cities, towns, villages, strip developments along highways, transportation, power, and communications facilities, and such isolated units as mills, mines, and quarries, shopping centers, and institutions.

As development progresses, small blocks of land of less intensive or nonconforming use may be isolated in the midst of built-up areas and will generally be included in the 01-category. Agricultural, forest, or water areas on the fringe of Urban and Built-up areas will not be included except where they are part of low-density urban development. The Urban and Built-up Land category takes precedence over others when the criteria for more than one category are met. Thus, residential areas that have sufficient tree cover to meet Forest Land criteria will be placed in the Residential category.

The Level II categories of Urban and Built-up Land are: Residential; Commercial and Services; Industrial; Extractive; Transportation, Communications, and Utilities; Institutions; Strip and Clustered Settlements; Mixed; and Open and Other.

01-01. RESIDENTIAL

Residential land uses range from high density, represented by the multiple-unit structures of urban cores, to low density, where houses are on lots of more than an acre, on the periphery of urban expansion. Linear residential developments along transportation routes extending outward from urban areas should be included as residential appendages to urban centers, but care must be taken to distinguish them from commercial strips in the same locality. The residential strips generally have a uniform size and spacing of structures, linear driveways, and lawn areas; the commercial strips are more likely to have buildings of different sizes and spacing, large driveways, and parking areas. Residential development along shorelines is also linear and sometimes extends back only one residential parcel from the shoreline to the first road.

Areas of sparse residential land use will be included under another category. In some places, the boundary will be clear where new housing developments abut against intensively used agricultural areas, but the boundary may be vague and difficult to discern when residential development is sporadic, or occurs in small isolated units over an extended period of time in areas of mixed or less intensive uses. A careful evaluation of density and the overall relation of the area to the total urban complex must be made.

Residential sections may also be included in other use categories where they are integral parts of the other use. Housing on military bases, at colleges and universities, living quarters for laborers near a work base, or lodging for employees of agricultural field operations or resorts are often difficult to identify and may be placed within the institutional, industrial, agricultural, or commercial categories.

01-02. COMMERCIAL AND SERVICES

Commercial areas are those used predominantly for the sale of products and services. They are often abutted by residential, agricultural, or other contrasting uses which help define them. The principal components of the Commercial-use category are urban central business districts; shopping centers, usually in

Source: Anderson, J.R. et al. (1972) A Land-Use Classification System for Use With Remote-Sensor Data. Geological Survey Circular 671. Washington, D.C.: U.S. Geological Survey.

06-02. **Nonforested Wetland**

Nonforested Wetlands consist of seasonally flooded basins and flats, meadows, marshes, and bogs. Wetlands are usually relatively level areas. Uniform identification is difficult because the wetland areas change as the result of such factors as long term drought, high rainfall, seasonal fluctuations in precipitation, and diurnal tides. The observations must be correlated with tide and weather information to obtain consistent results.

Open saline- and fresh-water areas, sounds, and bays are included under 05-Water. Wetland areas with a 10 percent forest crown cover, or where recent clear cutting has occurred, are placed in 04-Forest Land.

Nonforested Wetland may be either Vegetated or Bare.

Vegetated Nonforested Wetland includes areas where the forest crown cover is less than 10 percent or the vegetation is nonwoody. Cattails, tules, and grasses such as Indian rice grass and saw grass occur in fresh-water marshes, and salt-tolerant grasses such as Spartina occur in the salt marshes.

Bare nonforested wetland has Tidal flats as its main component.

07. Barren Land

Barren land is land of limited ability to support life and little or no vegetation. In general, it appears to be an area of oily soil, sand, and rocks. Vegetation, if present, is more widely spaced and scrubby than that in the Desert Shrub subcategory of Rangeland except when unusual conditions, such as a heavy rainfall, occasionally result in growth of a short-lived more impressive plant cover.

Land may be temporarily barren owing to man's activities, but such land is usually included in another land-use category. Agricultural land may be temporarily without vegetation because of tillage practices. Sites for urban development may be stripped of cover before construction begins. Areas of extractive and industrial land have waste and tailings dumps, and exhausted sources of material supply are often evident.

Level II categories of Barren Land are: Salt Flats, Beaches, Sand Other Than Beaches, Bare Exposed Rock, and Other.

07-01. SALT FLATS

Salt flats are the flat-floored bottoms of interior desert basins. For a short time after a cloudburst, they may be covered by a sheet of water, or playa lake. On vertical air photographs they appear as white scars in the desert because the soil, flatness, and color cause a diffused reflectancy much higher than the albedo of other desert features.

07-02. BEACHES

Beaches are the smooth sloping accumulations of sand and gravel along shorelines. The surface is stable inland, but the shoreward part is subject to erosion by wind and water, and material is deposited in protected areas. The Beach category is not used if there is vegetative cover or another land use.

07-03. SAND AND OTHER THAN BEACHES

Sand Other Than Beaches is composed primarily of dunes, accumulations of sand of aeolian origin. Dunes are most commonly found in deserts although they also occur on shore and strand lines, coastal plains, river flood plains, deltas, and in periglacial environments. They are of various shapes, the crescentic being the most elementary; and range in size from diameters of a few to several thousand meters and in height from one to several hundred meters. Isolated crescent-shaped dunes migrate freely, but longitudinal dunes tend to remain nearly fixed in position.

07-04. BARE EXPOSED ROCK

The Bare Exposed Rock category includes areas of bedrock exposure, desert pavement,

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CHAPTER 4

THE DEVELOPMENT OF PROJECTS AFFECTING WETLANDS

The process for initiating and implementing projects affecting wetlands in the New Orleans Standard Metropolitan Statistical Area (SMSA) will be discussed in this chapter. Major types of projects initiated in the four parishes will be identified; flow diagrams will be presented to illustrate the process followed in developing these projects.

TYPES OF PROJECTS

There are three basic categories of projects initiated in the four parishes that affect the wetlands of the SMSA. These are:

1) Extraction
2) Transportation
3) Reclamation

Extractive activities affect the wetland areas mainly through oil and gas production and pipelines. The transportation system includes canals, roads, and railroads that traverse the coastal areas. Reclamation projects drain wetlands in order to create an environment that will sustain development.

Extractive Industries

In the SMSA the major extractive industry is the production and distribution of natural gas and oil. There is a potential for much damage to wetlands due primarily to the extensive channelization needed for access to the oil and gas wells and pipeline canals for the transportation of oil and gas to the refinery. McGinnis et al. (1972) has estimated that there is about 0.5 square miles of marshland removed for each 100 miles of pipeline constructed. According to Barrett (1970) there are nearly 4600 miles of canals and channels in coastal Louisiana, many of which are related to oil and gas extraction. Over a period of time, the indirect effects of channelization cause greater land loss than that resulting from the initial construction. The altered salinities and water circulation patterns of these canals cause permanent changes in critical estuarine regimes.

Private firms initiate oil and gas exploration, production and pipeline installation. According to the Bureau of Land Management (1974: 28-79) approval of some or all of the following agencies may be necessary to build and maintain a pipeline through a local area.[1]

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[1]For a discussion of pipeline construction, see Mumphrey et al.(1976: 103-108).

1) Department of Interior

   a) Bureau of Land Management (has jurisdiction over rights of way for common carrier pipelines on the outer continental shelf (OCS).

   b) Geological Survey (has jurisdiction over producer-owned gathering lines and flow lines on the OCS).

   c) Bureau of Sport Fisheries and Wildlife (responsible for protecting fish and wildlife resources, through consulation with the Corps of Engineers).

2) U.S. Army Corps of Engineers (issues permits for construction on OCS and in other navigable waters[2]).

3) Federal Power Commission (grants certificates of convenience and necessity prior to the construction of interstate natural gas pipelines).

4) Interstate Commerce Commission (grants approval of the tariff rates for transportation of oil by common carrier pipeline).

5) Department of Transportation, Office of Pipeline Safety (establishes standards for pipeline construction and maintenance).

6) National Marine Fisheries (inputs into U.S. Army Corps of Engineers permitting process).

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[2]Under section 404(b) of the Federal Water Pollution Control Act of 1972 (U.S. Congress, 1972) the permitting authority of the U.S. Army Corps of Engineers has been expanded to navigable waters and their contiguous wetlands as of July 1976 (Buisson (1976)).

The U.S. Army Corps of Engineers is the main permitting agency for companies that install pipelines in the estuarine areas. Based on reviews from agencies such as National Marine Fisheries, the Environmental Protection Agency (EPA), and the Bureau of Sport Fisheries, the Corps makes an environmental assessment of any private construction project, such as a pipeline. If it is determined by the district engineer that a project is of "minor significance", an environmental impact statement (EIS) is not required and the permit can be granted. If it is determined that an action is "significant" in its impact[3] then the private concern must retain a consultant and produce all relevant information as provided for by law to the Corps. The Corps then issues the draft EIS, since they are the "lead" agency with jurisdiction in this case (Decker, 1976). Only after review, comment, and approval, can the project begin. Oil drilling companies must also obtain a Corps permit for dredge and fill operation and an EPA permit if they dump pollutants into the surrounding water. They also need a permit from the United States Geological Survey in order to drill.

Most contacts for permits to implement projects in open wetland occur between the Corps of Engineers (and other federal agencies) and the private firms that initiate the projects. Because the Federal Government has control

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[3]This is done through an in-house environmental assessment.

over the unleveed wetlands in the four parishes of the SMSA, the parish governments are largely bypassed in the permitting process. For example, in St. Bernard Parish, Chetta (1976) has admitted that all pipeline permits, canals, and utility rights of way are rubber stamped by the Police Jury since there is no CZM ordinance clearly dealing with these problems. The only difficulty encountered by private enterprises is from the federal regulating agencies.

Trasnportation

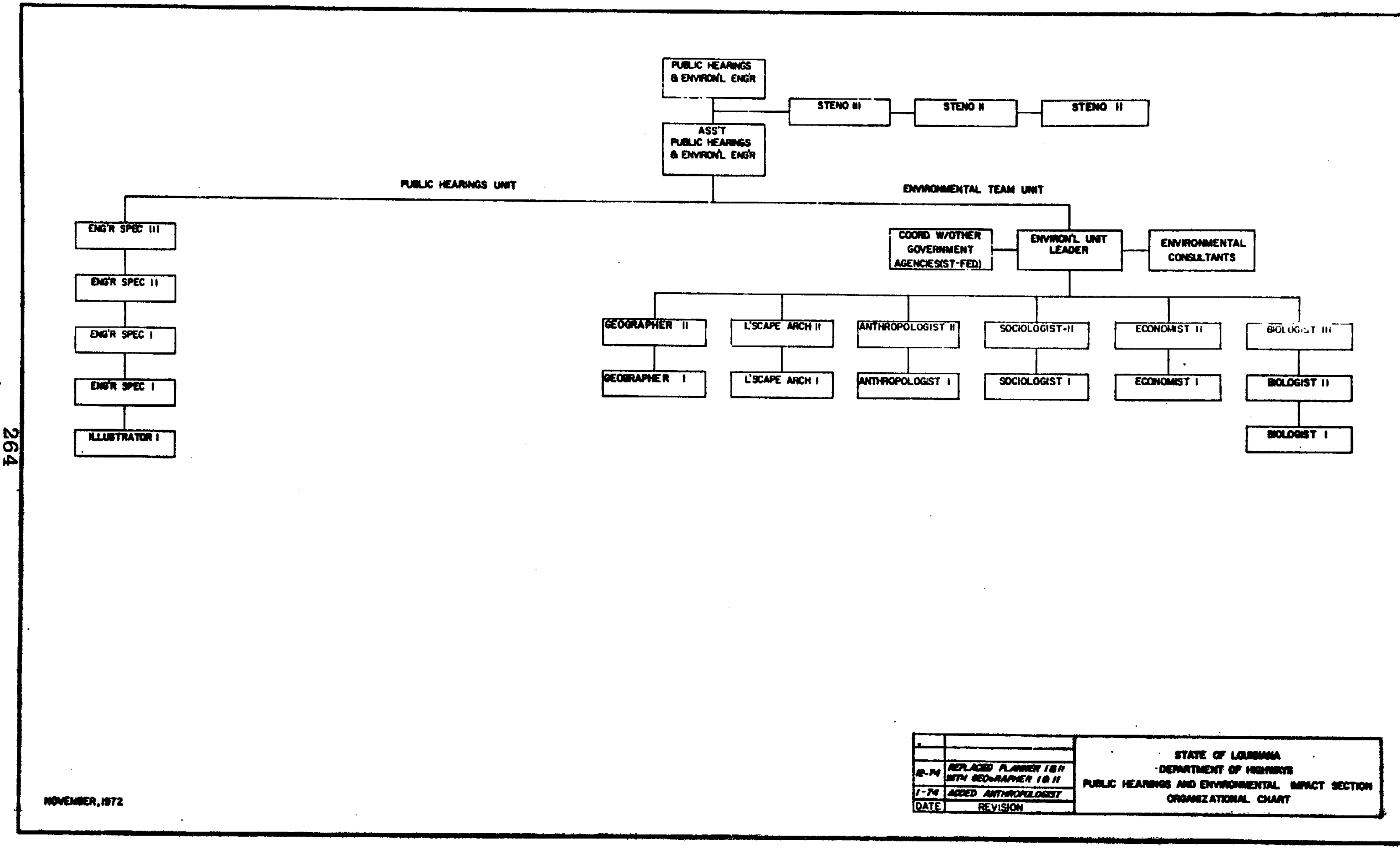
A highway, canal or railroad can be a major factor affecting the condition of estuarine areas in Louisiana. Canals for transportation tend to be deeper and wider than pipeline canals. This consequently results in more estuarine loss due to dredging and spoil deposition. As with pipeline canals, altered estuarine regimes increase land loss also. All three types of transportation arteries block water circulation patterns. Roads and railroads act as levees. Canals alter salinities and enable wave action to erode surrounding marshland (see Mumphrey, et al. 1975: 82-93).

Most new transportation construction in the wetlands deals with roads or canals. Many roads and canals are far too expensive to be constructed soley with private, local or even state funds. The federal government, therefore, either constructs these projects directly, or the state or local governments do the work with the help of Federal monies.

Under the National Environmental Protection Act (U.S. Congress, 1969) federally funded projects are subject to formal impact assessment before construction can begin. In the case of highways, the State of Louisiana would be responsible for drawing up an EIS for a proposed roadway (if it were determined that the action would have significant impact). This would be submitted to the lead agency, which would be the Federal Highway Administration in this case). If it goes through wetlands, the Corps of Engineers would also be required to issue a permit, after having received an EIS. Water discharged from the highway would require an EPA permit. By law the State Highway Department would have to submit the EIS to the Council on Environmental Quality for review also, as well as any other relevant federal agency such as National Marine Fisheries (Louisiana State Highway Department, 1976). Figure 4.1 presents the organization of the EIS section of the Louisiana Highway Department. The initiation of a highway project may come from the federal, state or local level. Major roadwork is implemented by the state, whether it is a state or federal roadway.

If the construction of a highway involves a bridge over a navigable body of water (the Mississippi River, for example) the Coast Guard must issue a permit for construction. The Coast Guard require an EIS for the project if it is determined to be of "significant" impact.

FIGURE 4.1



Source: Louisiana Department of Highways, 1976: 2-5.

Canals for navigation purposes are always built as Public works projects and administered through the U.S. Army Corps of Engineers. Examples of major canal construction in Louisiana are the Gulf Intercoastal Waterway and the Mississippi River Gulf Outlet.

Although these projects are administered by the Corps of Engineers, the funds come from Congress. The initial impetus for construction can come from any group - private municipal, state - that persuades its congressional representatives to push for a particular public works project. The Corps of Engineers may also initiate projects itself. Figure 4.2 illustrates the permit application and EIS review procedures of the Corps of Engineers. The basic steps that occur from the time a project is proposed to the time construction begins are outlined below[4] (Burk and Associates, Inc., 1975: 52-53):

1) A project is conceived by local, state, or federal entities and is introduced to the Committee on Public Works of either the House or Senate for consideration.
2) The committee then adpots a resolution calling for a preauthorization study, and forwards this to the Corps Chief of Engineers.

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[4]See Appendix 4.1 for flow charts for various activities performed by the Corps of Engineers regarding permitting, in house projects, etc.

3. The Chief of Engineers then directs the proper Corps district to proceed with the preauthorization study.
4. The preauthorization study assesses the general feasibility and environmental impact of the proposed project. Included in this study is a draft environmental impact statement. If the project is found to be technically feasible and the benefit-cost analysis ratio is determined to be 1:1 or greater, a district project report is written recommending further study. A benefit-cost ratio of less than 1:1 indicates the project is not feasible.
5. The district project report is sent to Division Headquarters and then to the Chief of Engineers for review.
6. If the personnel at these levels concur with the conclusions of the report, it is returned to the Public Works Committee. If the project or project report is found to be inadequate, it is returned to the district level for revision.
7. If the report is favorable and the committee concurs, it is placed before the full House or Senate as part of a bill. If it is passed, the Corps is directed to conduct a post-authorization study.

8. In the post authorization study, the project is examined in much greater depth for technical feasibility and the impact statement is refined and expanded if necessary. If this study shows that the benefit-cost ratio is still 1:1 or greater, it is sent to the divisional and national level for review.
9. If the review at both these levels is favorable, it is returned again to the Public Works Committee for their review. If they concur with the results of the study, a general design study is authorized in which the general design specifications are determined. A revision of the EIS is included in this study.
10. With the completion of this study, a project report is returned to Congress for project authorization. The project is included as a part of a bill, passed by Congress, and signed by the President.
11. Before obtaining funding, the bill is examined by the Office of Management & Budget (OMB). If they concur that the project should be funded, the project is returned to Congress in an appropriations bill.
12. Once Congress passes the appropriations bill, the project is funded and can go to development of detailed design specifications and construction.

GENERALIZED CORPS OF ENGINEERS

FIGURE 4.2

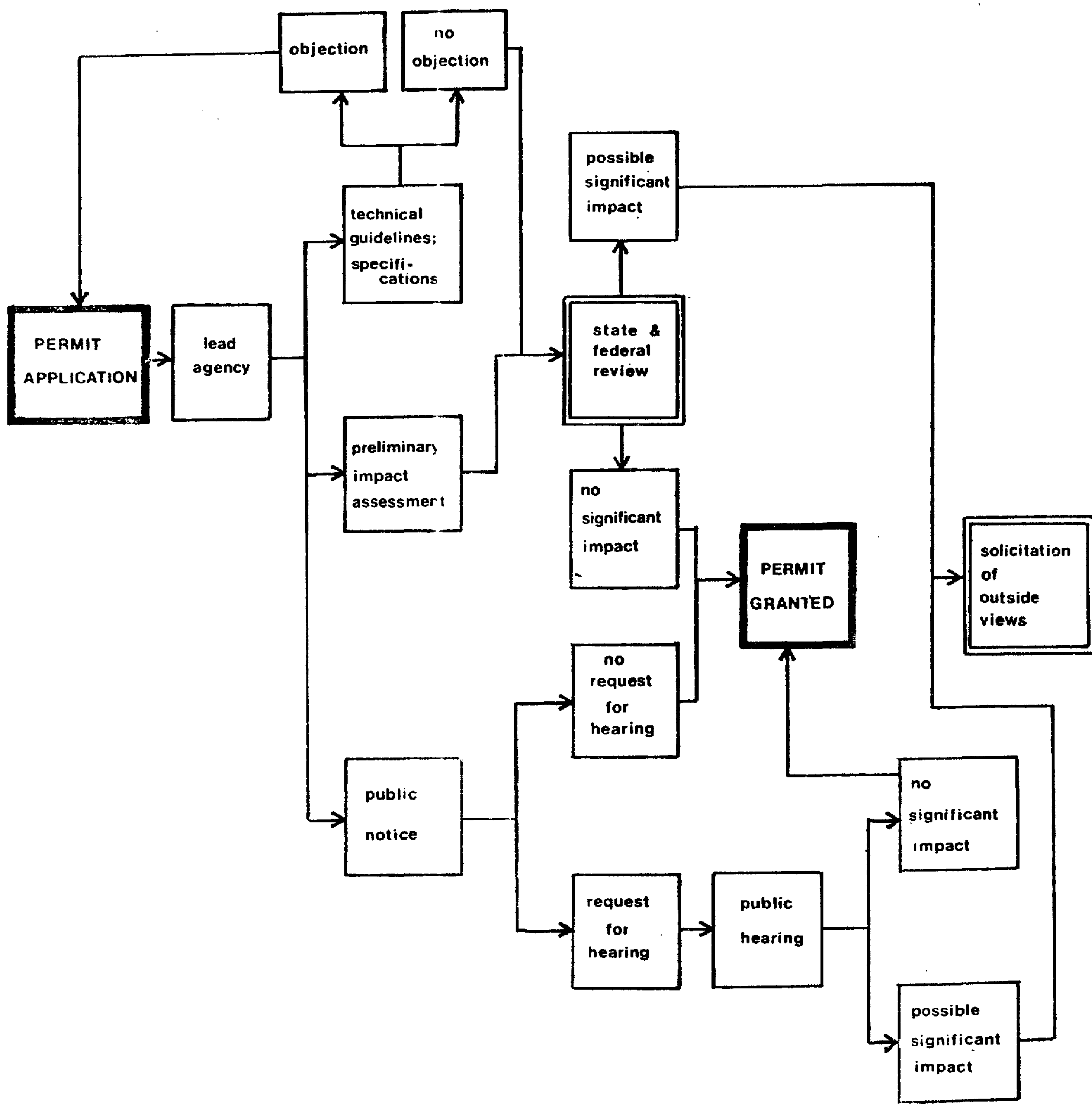
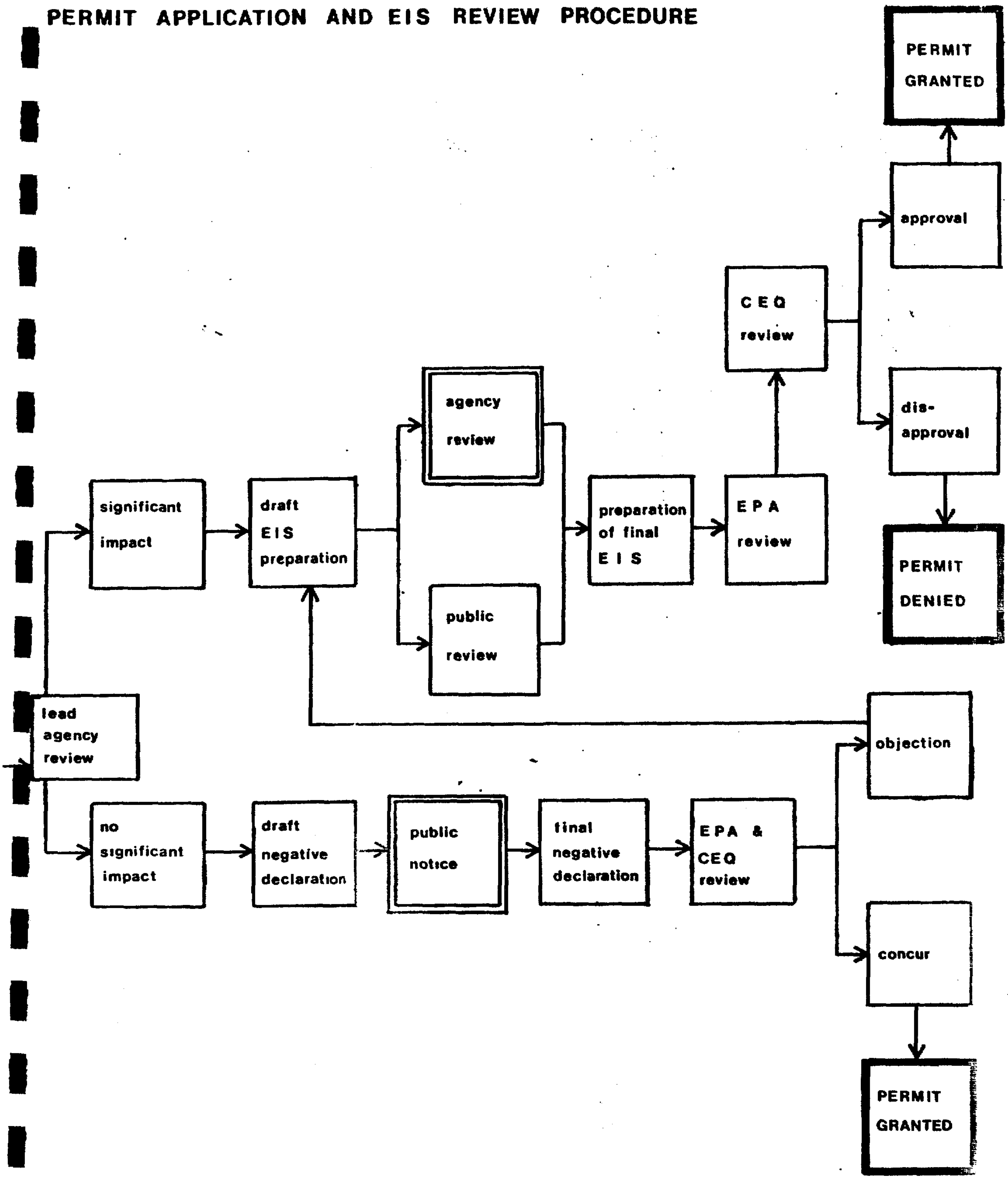


FIGURE 4.2 Continued



Source: Burk and Associates 1975: 54-55.

This process is followed for any major public works project involving canal building, levee construction, and dredging and filling, including reclamation projects (to be discussed below).

The construction of major interparish roads, and canals through wetland areas is implemented at the federal or state levels. Parish governments could reject these projects but they do not actively institute, plan, or construct these transportation arteries. They may include these new projects in comprehensive plans so as to incorporate them into the future scheme of land use as envisioned in such a plan. The parish participation in these projects, therefore, is mainly that of reaction to, rather than initiating of, major roads or canals that impact on wetland areas.

Reclamation

This type of activity can be initiated by private firms, local, state or federal governments, and follows the permit process presented in the previous section. An example of a private reclamation project is the Eden Isles development along the shores of Lake Pontchartrain in St. Tammany Parish. This is a "Florida type" development in which canals are dredged and the spoil deposited on the banks as landfill. This fill provides homesites with water frontage; if enough spoil is dredged, the fill provides high ground safe from flooding. For this type of development, a dredge and fill permit is needed from the Corps of Engineers. A permit from EPA is needed to dump waste water and sewerage effluent into the canals. Under the expanded authority of section 404 of the Federal Water Pollution Control Act of 1972, anyone seeking a permit to undertake this kind of development in viable wetlands would face serious difficulties due to the stringent requirements of the act. The serious detrimental effects of such a development on wetlands is discussed in Mumphrey et al. (1975: 47-82).

Most larger traditional reclamation projects are now the province of state and federal agencies, primarily the various state levee boards and the U.S. Army Corps of Engineers. Since protection from flooding is essential, the first item that is needed in a reclamation project is a levee to keep out floodwaters. According to Buisson (1976) the prime purpose of the Corps of Engineer's flood protection works is flood protection, not reclamation. In the past, as residents moved into low-lying areas, they clamored for increased flood protection. This pressure caused new projects to be devised and levees extended or pushed further into wetland areas to accommodate new growth. In some cases uninhabited lands were leveed off, based on the probability of population expansion into that area.

An example of this anticipatory type of protection plan is the Lake Pontchartrain Louisiana and Vicinity

Hurricanes Protection Plan. Part of this plan was devised with the idea of increasing protection for a large tract of undeveloped wetland in eastern New Orleans slated for a 28,000 acre development called "Orlandia". This type of action has led some to accuse the Corps of being in the land development business rather than flood protection. If a developer sustains a "windfall" profit from a Corps project, he is required to pay a percentage of the cost of the levee project. However, this provision is sometimes easy to avoid, resulting in federal subsidy of private development. Federal Flood Insurance requirements of a +10 ft. Mean Sea Level (M.S.L.) (Burk, 1975) slab elevation outside of leveed areas in Louisiana now make it prohibitively expensive to develop wetlands privately. Only the federal and state governments have sufficient funds to accomplish traditional reclamation and flood protection activities without which it is impossible to develop wetlands safely. Therefore, despite the fact that local governments or large developers may initiate plans for development of wetlands, they cannot implement their plans without public funds. Even the state cannot afford to construct large projects alone. Although the various levee boards are responsible for the maintainence of all levees once they are complete, they can no longer afford to construct them without federal funds. The last levee constructed in New Orleans, for example, totally by the Orleans Levee Board was in the mid-1960's (McNamara, 1976).

The levee boards, however, still cost share with federal agencies on new projects. As with the Corps of Engineers, anyone can propose a project to a Levee Board. The boards are so dependent on federal money for large projects, however, that the Corps of Engineers is effectively the major agency to consider when requesting new levees or other flood protection projects.

The Comprehensive Plans of Jefferson (1974), Orleans (1970), St. Bernard (1971), and St. Tammany (1972) do not deal with any wetland related issues. Since new land that is to be considered developable must already have a levee protecting it, the only things that land use regulations concern themselves with are proper alignment of streets, proper drainage and sewerage, standards for construction, etc. The city or parish must meet EPA requirements to obtain permits for effluent dumping into the Mississippi or other body of water, but the primary impetus for development of wetlands must come from the Corps of Engineers. Without their projects, it would be virtually impossible to safely develop a majority of the wetlands areas for urban use.

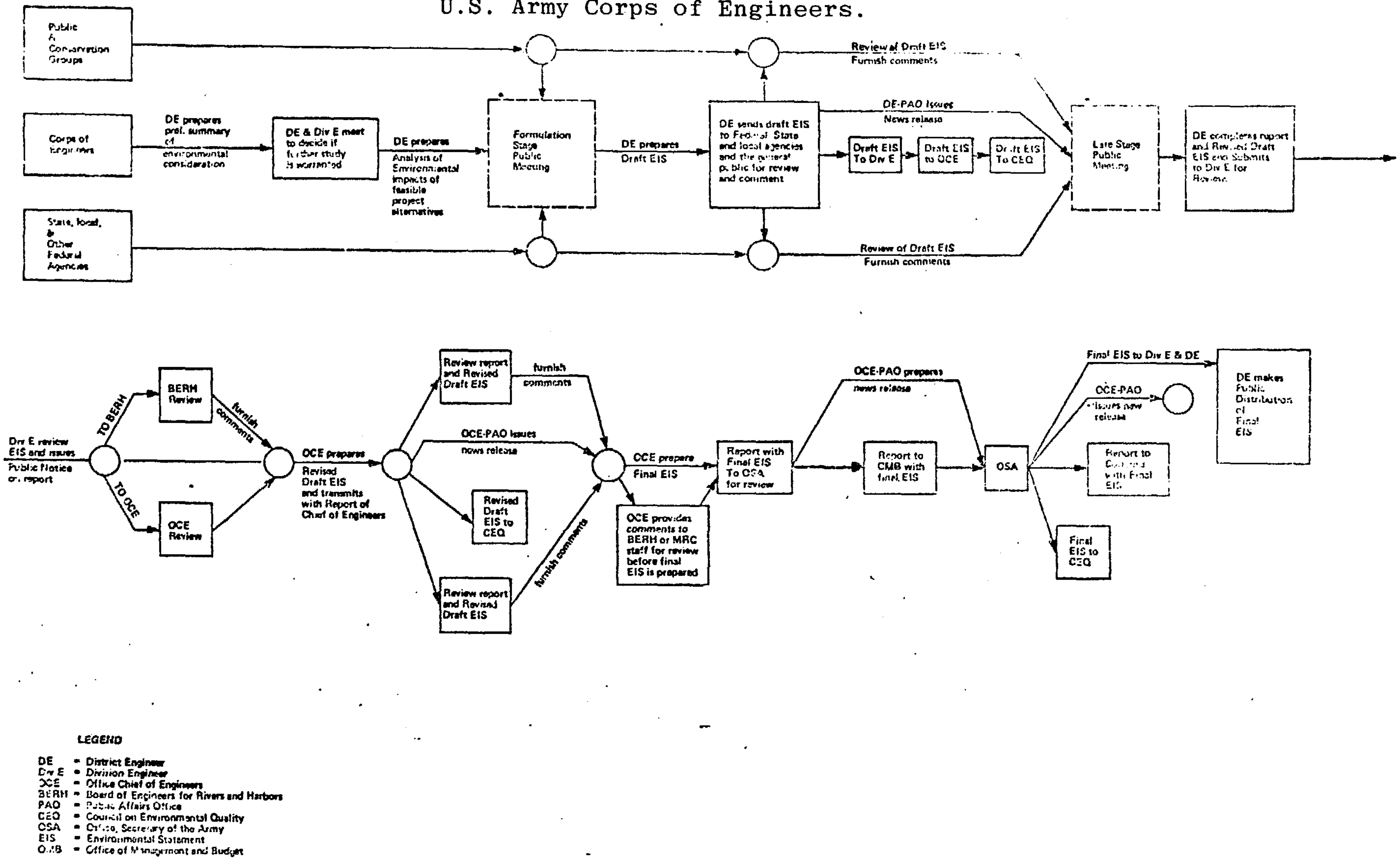
SUMMARY

Extractive activities are initiated and constructed by private concerns. Transportation and reclamation activities are primarily public works projects that are constructed by governmental agencies; the projects may be initiated by any private group or agency. The U.S. Army

Corps of Engineers is the lead agency for all development in wetlands. Whether the Corps initiates projects or not, everything must be funnelled through them for approval and permitting. Section 404 of the Federal Water Pollution Control Act of 1972 has given them virtually unlimited power in the wetland areas of the New Orleans SMSA. The parish government officials themselves initiate little if any of the projects that have impact on the coastal zones of the SMSA. The officials respond to initiatives from private industry or the public sector, mainly the federal government.

APPENDIX 4:1

Flow Charts for environmental permitting, Survey Reports, Authorized Projects etc. of the U.S. Army Corps of Engineers.

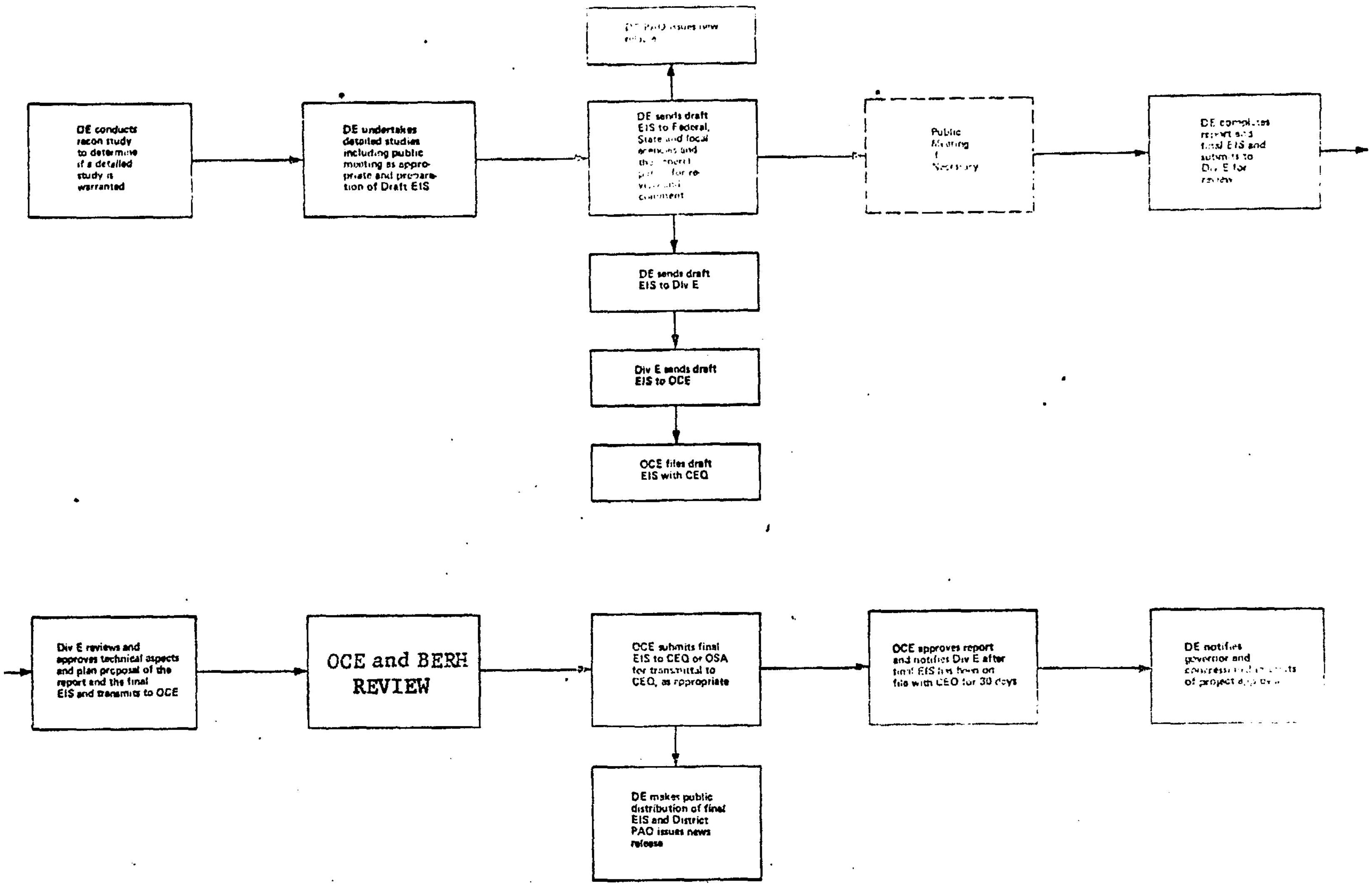


Source: Office of the Chief Engineers, Department of the Army, 1973: Appendix D.

Type of Action – Survey Reports

CHRONOLOGY – Preparation and Coordination of Environmental Statements

APPENDIX 4:1 Continued



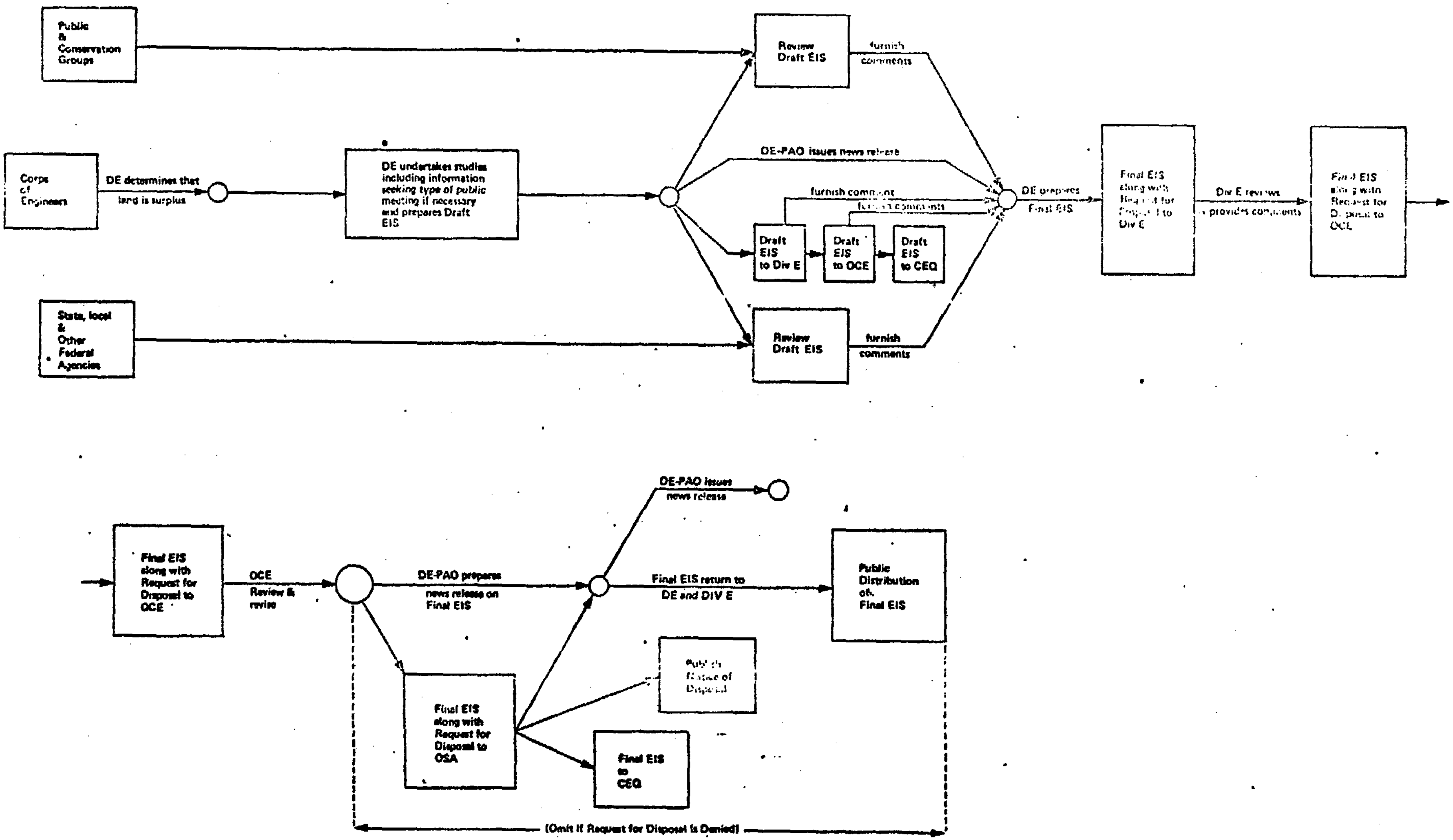
LEGEND

DE = District Engineers
Div E = Division Engineers
OCE = Office of Chief of Engineers
BERH = *Board of Engineers for Rivers and Harbors*
PAO = Public Affairs Office
CEQ = Council on Environmental Quality
OSA = *Office, Secretary of the Army*
EIS = Environmental Statement

Type of Action — SPECIAL PROJECTS AND CONTINUING AUTHORITIES

CHRONOLOGY — Preparation and Coordination of Environmental Statements

APPENDIX 4:1 Continued



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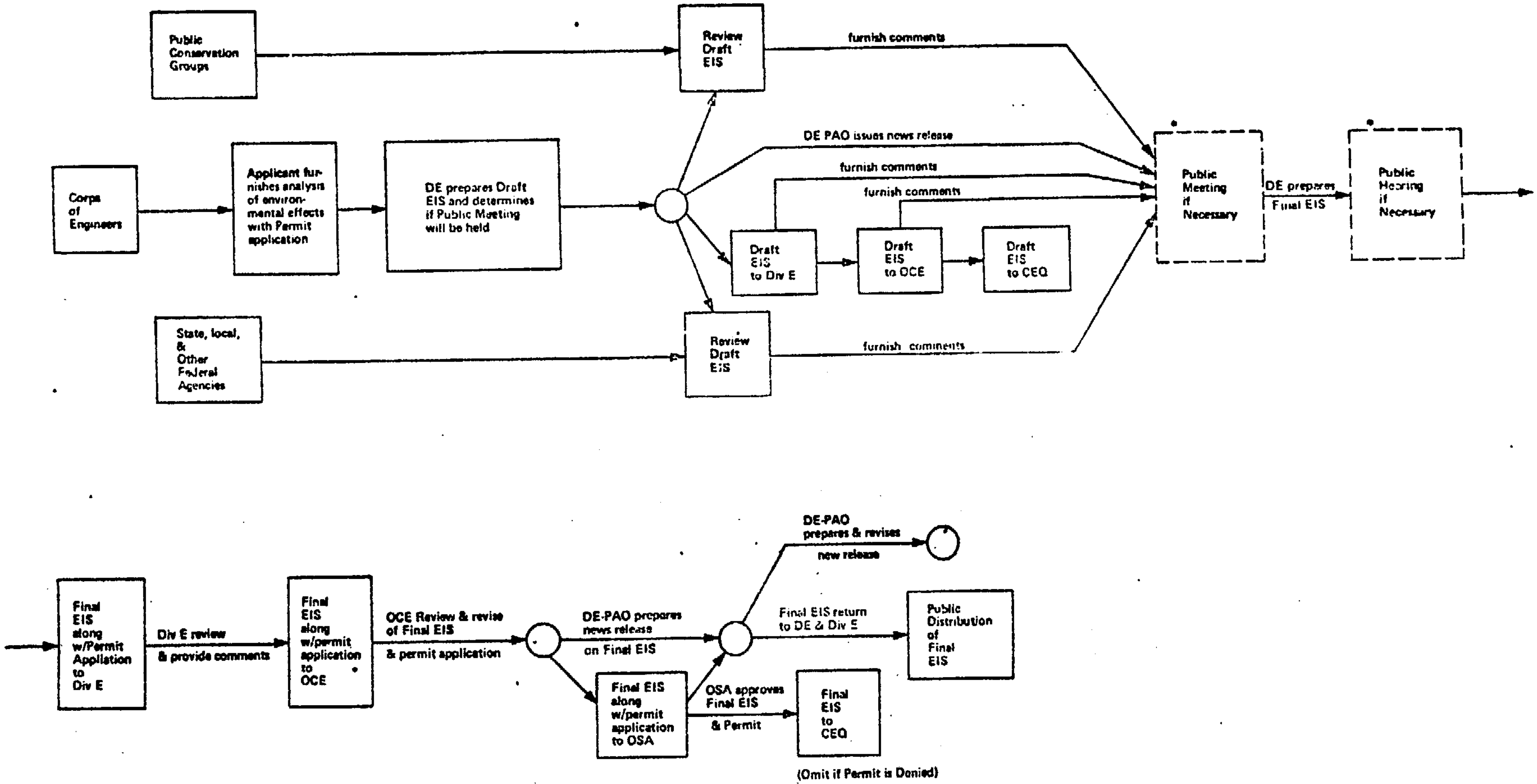
OSA = Office Secretary of the Army
EIS = Environmental Statement
OMB = Office of Management and Budget

Type of Action – DISPOSAL OF LAND

CHRONOLOGY – Preparation and Coordination of Environmental Statements



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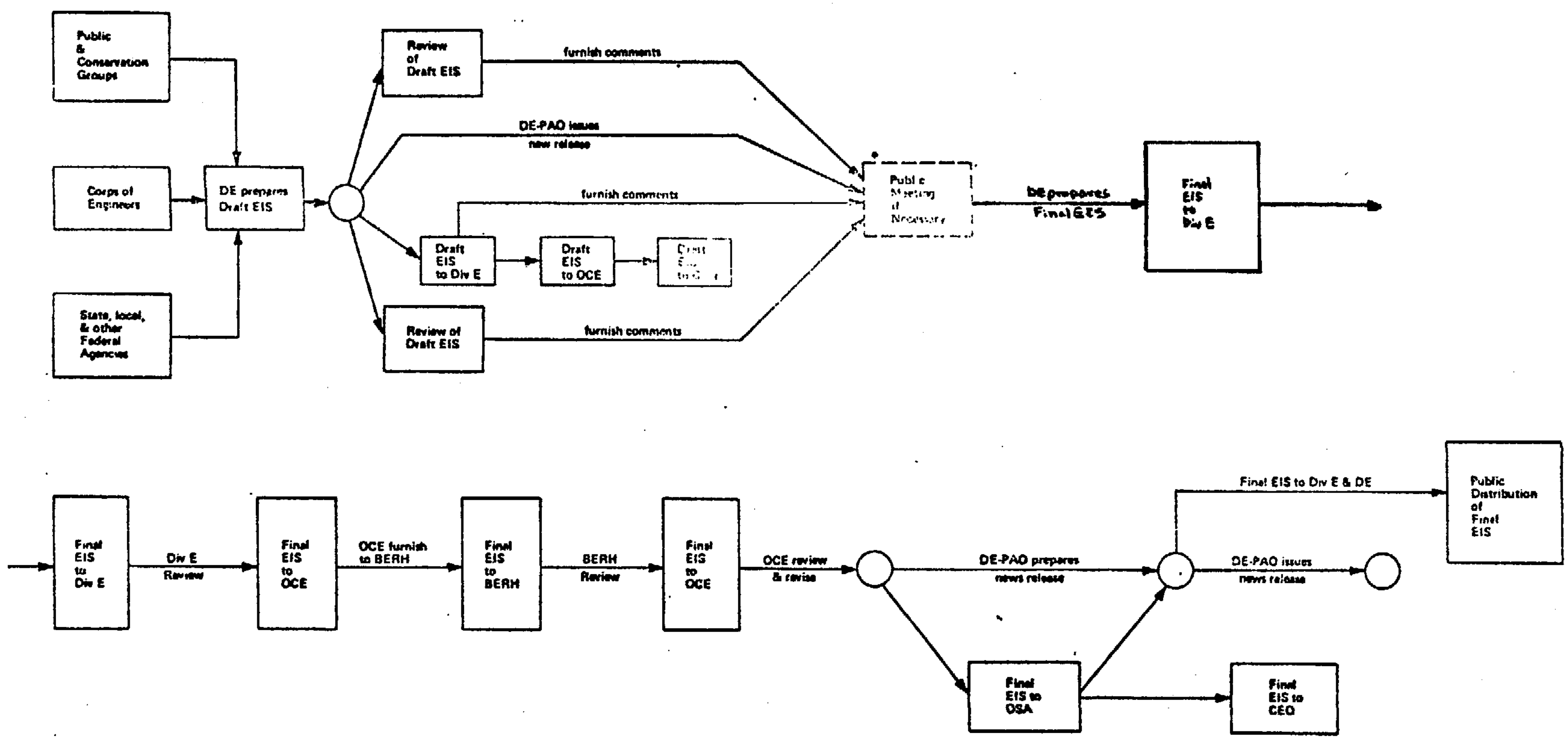
OMB = Office of Management and Budget

Type of Action – REGULATORY PERMITS

CHRONOLOGY – Preparation and Coordination of Environmental Statements

APPENDIX 4:1 Continued

FOR PROJECTS WITHOUT PRIOR ENVIRONMENTAL STATEMENT



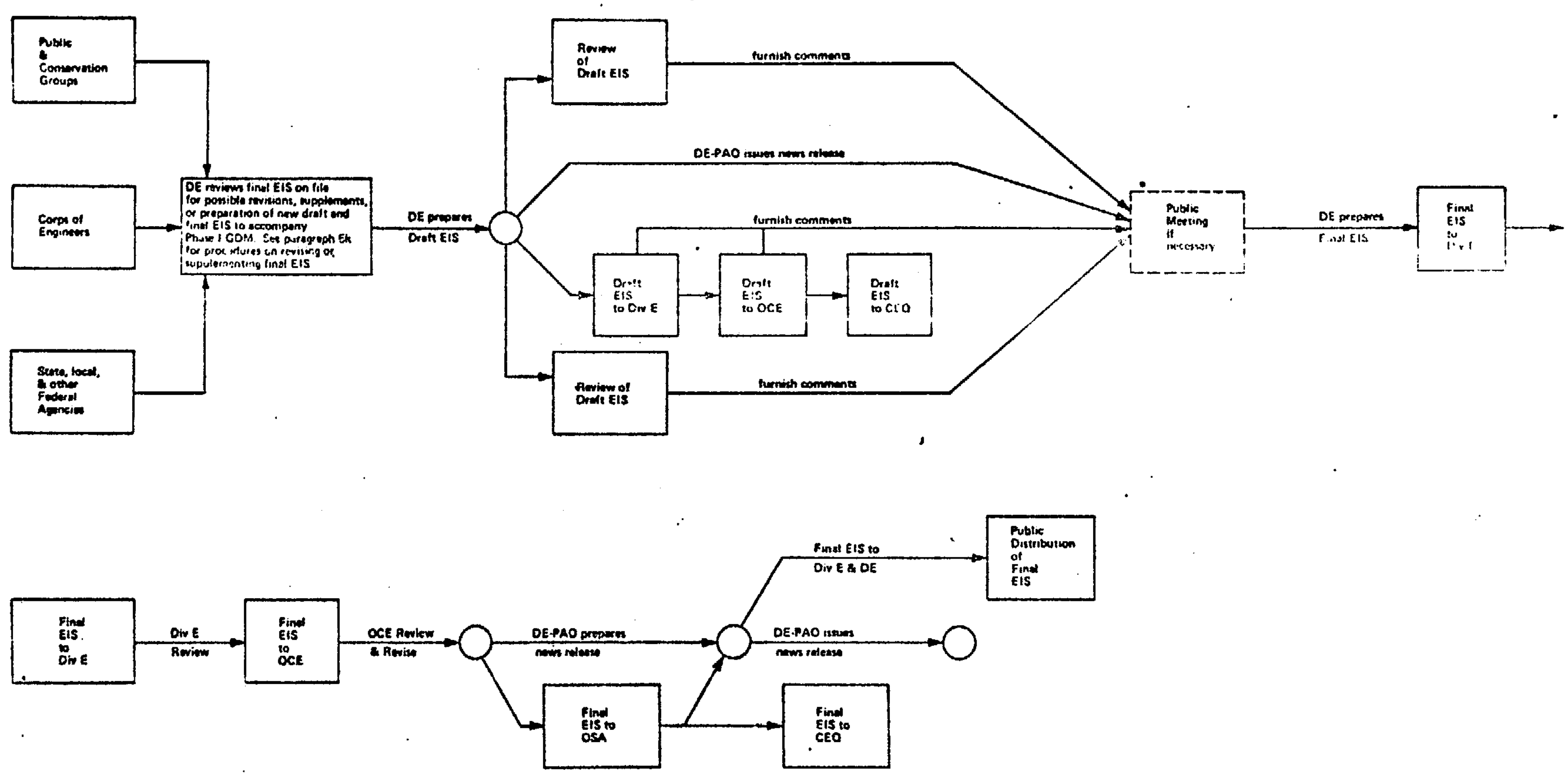
LEGEND
See D-1

Type of Action – AUTHORIZED PROJECTS NOT STARTED

CHRONOLOGY – Preparation and Coordination of Environmental Statements

APPENDIX 4:1 Continued

FOR PROJECTS WITH PRIOR ENVIRONMENTAL STATEMENT



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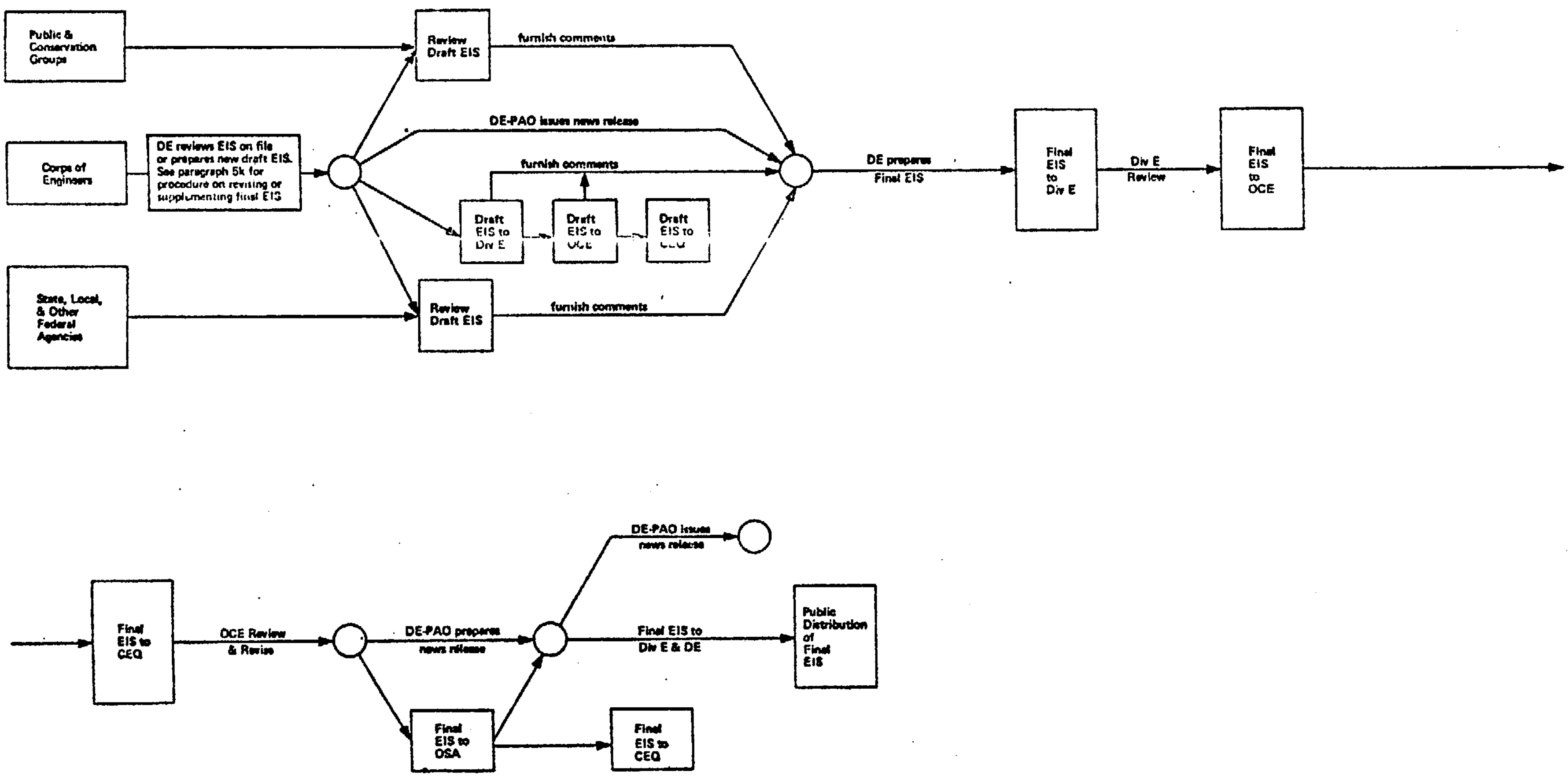
Type of Action – AUTHORIZED PROJECTS NOT STARTED

CHRONOLOGY – Preparation and Coordination of Environmental Statements

APPENDIX 4:1 Continued



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CHRONOLOGY — Preparation and Coordination of Environmental Statements

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CHAPTER 5

DEVELOPMENT OF A MODEL COASTAL ZONE MANAGEMENT PROGRAM AND AN EVALUATION OF CZM PROGRAMS IN THE NEW ORLEANS SMSA

INTRODUCTION

Nature of the Coastal Zone

The term "coastal zone" has been used extensively to describe the interface between land and sea in the United States. Thirty states and four United States territories possess lands that have a direct relationship with the oceans, gulfs, or lakes near them, thus possessing a "coastal zone" (Coastal States Organization: 1974) (see Table 5.1).

This interface may be abrupt, as in California with its rocky cliffs and beaches, or broad, as in Louisiana with its deltaic-estuarine system of low-lying lands extending many miles inland. It has been recognized increasingly that these "meetings of land and water" are valuable, productive areas requiring careful management.

What constitutes the coastal zone of a particular state has created conflicts among government officials as they seek to define it. The Coastal Zone Management Act of 1972 (U.S. Congress, 1972) defines it as:

> The coastal waters (including the lands therein and thereunder) and the adjacent shorelines (including the waters therein and thereunder) strongly influenced by each other and in proximity to the shorelines of the several coastal states, and

TABLE 5.1

COASTAL STATES AND TERRITORIES

Alabama	Mississippi
Alaska	New Hampshire
California	New Jersey
Connecticut	New York
Delaware	North Carolina
Florida	Ohio
Georgia	Oregon
Guam	Pennsylvania
Hawaii	Puerto Rico
Illinois	Rhode Island
Indiana	Samoa
Louisiana	South Carolina
Maine	Texas
Maryland	Virginia
Massachusetts	Virgin Islands
Michigan	Washington
Minnesota	Wisconsin

Source: Coastal States Organization, 1974: Frontpiece.

> includes transitional and intertidal areas in the Great Lakes as cited in Robbins and Hershman, 1974: 306).

Using this general definition, various states have determined their coasts using different criteria. California, a state having a sharply defined coastline and coastal influence, has established a continuous boundary mainly consisting of:

> ...the highest elevation of the nearest coastal mountain range or five miles from the mean high tide line, whichever is the shorter distance (Robbins and Hershman, 1974: 318).

Connecticut has defined and described its coastal zone by means of vegetation characteristics and the criteria of being one foot below or above tidal waters (Robbins and Hershman, 1974). Through the Louisiana Coast and Marine Resources Conservation and Development Act of 1965, Louisiana defined the coastal zone as:

> ...the lands, waters, tidal and submerged lands, bays, estuaries, marshes, coastal and intertidal areas, harbors, lagoons, inshore waters, and channels landward of the outer limit of the territorial sea of the United States or of the state of Louisiana or of other waters subject to the jurisdiction of Louisiana...extending inland to the landward extent of marine influences (Robbins and Hershman, 1974: 321-322).

The definitions of what constitutes a state's coastal zone vary considerably from state to state because of the differences in the coasts being considered. It is certain, however, that the coastal areas are too valuable a resource to be allowed to continue to deteriorate as has been the case in recent years.

This chapter deals principally with one coastal state, Louisiana. After a brief review of the value of Louisiana's coastal areas, a model for developing a coastal zone management (CZM) program is developed. Finally, the various parish coastal zone plans in the New Orleans Standard Metropolitan Statistical Area are reviewed and evaluated against the model and against the proposed State Coastal Resources Program (Louisiana State Planning Office, 1976). The following description of Louisiana's coastal zone illustrates the need for a sound coastal management practice.

Louisiana: A State of Wetlands

Louisiana has more land areas that can be considered part of the coastal zone than any other state. Of the 30 million acres of estuarine waters and wetlands in the United States, Louisiana possesses 6,780,644 acres. Of these, 3,457,012 acres are classified as nonforested wetland, or marsh. 3,323,632 acres are classified as forested wetlands, or swamp (Louisiana State Planning Office, 1975a, Louisiana Advisory Commission on Coastal and Marine Resources (1973). These wetlands were formed primarily by fluvial deposition from the Mississippi River since the last great Ice Age.

This dynamic interaction between river delta-building and sea erosion has evolved into the most productive wetlands, ecologically and economically, in the United States (Louisiana

Advisory Commission on Coastal and Marine Resources, 1973). According to the National Marine Fisheries Service (1975), Louisiana's commercial landings totaled 1,228,906,000 pounds in 1974. This was approximately 25 percent of the total U.S. fish catch of 4,939,600,000 pounds. The closest rival to Louisiana was California, with only 61 percent of the Louisiana catch for 1974 (see Table 5.2).

These productive coastal lands in Louisiana are currently sustaining multiple use in many areas. Some of these uses are detrimental to the natural system. This has stimulated concern at federal, state, and local levels, inducing Louisiana to begin the long process of developing management plans that seek to balance the needs of man--such as population growth; commercial, industrial, and residential expansion; and recreation--with the needs of the fragile and complex ecological system that must co-exist with man in the coastal zone.

In developing a coastal resources plan for Louisiana, one of the first items that had to be determined was exactly where the coastal influence ceased. The seaward and lateral boundaries of the state were set by law, but the determination of where the broad coastal areas ended was a difficult task for the planners in Louisiana. After considering many factors, a study by McIntire et al. (1975) determined the exact landward boundary of coastal influence. McIntire used primarily the contact line between Pleistocene and recent sediments

TABLE 5.2

U.S. COMMERCIAL LANDINGS

TEN MOST PRODUCTIVE STATES: 1974*

State	Pounds	Value
Louisiana	1,228,906,000	$ 86,694,000
California	745,047,000	130,381,000
Virginia	507,293,000	59,031,000
Alaska	456,864,000	141,120,000
Mississippi	304,794,000	16,355,000
Massachusetts	268,659,000	61,784,000
North Carolina	206,683,000	17,544,000
Florida	171,394,000	66,367,000
New Jersey	166,962,000	16,607,000
Maine	147,822,000	41,410,000
10-State Total	3,813,104,000	$637,293,000
Total U.S. Catch	4,939,600,000	$898,500,000

*Ranked by pound catch.

Source: National Marine Fisheries, 1974: 18.

(ordinarily depicted near the coast by the five-foot contour line). Before deciding on this line, 21 biophysical and legal parameters were employed to determine the landward extension of coastal effects (see Table 5.3) as well as the lateral and seaward boundaries. This provided the state of Louisiana with exact demarcation lines for the coastal zone, enabling it to accurately determine where the limits of coastal influence are located (see Figure 5.1).

Problems of the Louisiana Coastal Zone

The Delicate Ecologic Cycle

A balanced delicate natural system has evolved over many thousands of years in Louisiana's coastal areas. Tampering with the system causes imbalances that upset the equilibrium of the biological and chemical cycles and, ultimately, affects natural productivity. Clark (1974) has defined some physical properties of estuaries that govern their productivity (see Table 5.4). These properties must exist for the system to function effectively. For example, anything that restricts or overenhances water flow, or causes interruptions in the production of detritus[1] can severely restrict or even destroy the estuary system functions. A study by Day *et al*. (1973)

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[1] Darnell (1967) has defined detritus as all types of biogenic material in various stages of microbial decomposition which represents potential energy sources for consumer species. Detritus can be likened to the fuel that runs the whole system and is a large determinant of its productivity.

TABLE 5.3

PARAMETERS DEFINING THE COASTAL ZONE

Biophysical

1. Geology -- Pleistocene/Recent Contact
2. Elevation -- 5 foot and 25 foot Contours
3. Soils -- Wetland/Nonwetland Boundary
4. Vegetation -- Wetland/Nonwetland Boundary
5. Hundred-Year Flood and Tidal Inundation Level
6. Salinity -- Inland Intrusion
7. Occurrence of *Rangia cuneata* (brackish water clam)
8. Inland Records of Crabs and Marine Fish
    a. *Callinectes sapidus* (blue crab)
    b. Totally freshwater fish (young and adult)
    c. Fish occurring in freshwater only as young
    d. Marine fish (occasional freshwater visitors)
9. Mammal and Reptile Ranges
    a. Reptiles
    b. Mammals
10. Birds -- Coastal Hiatus of Spring Trans-Gulf Migration

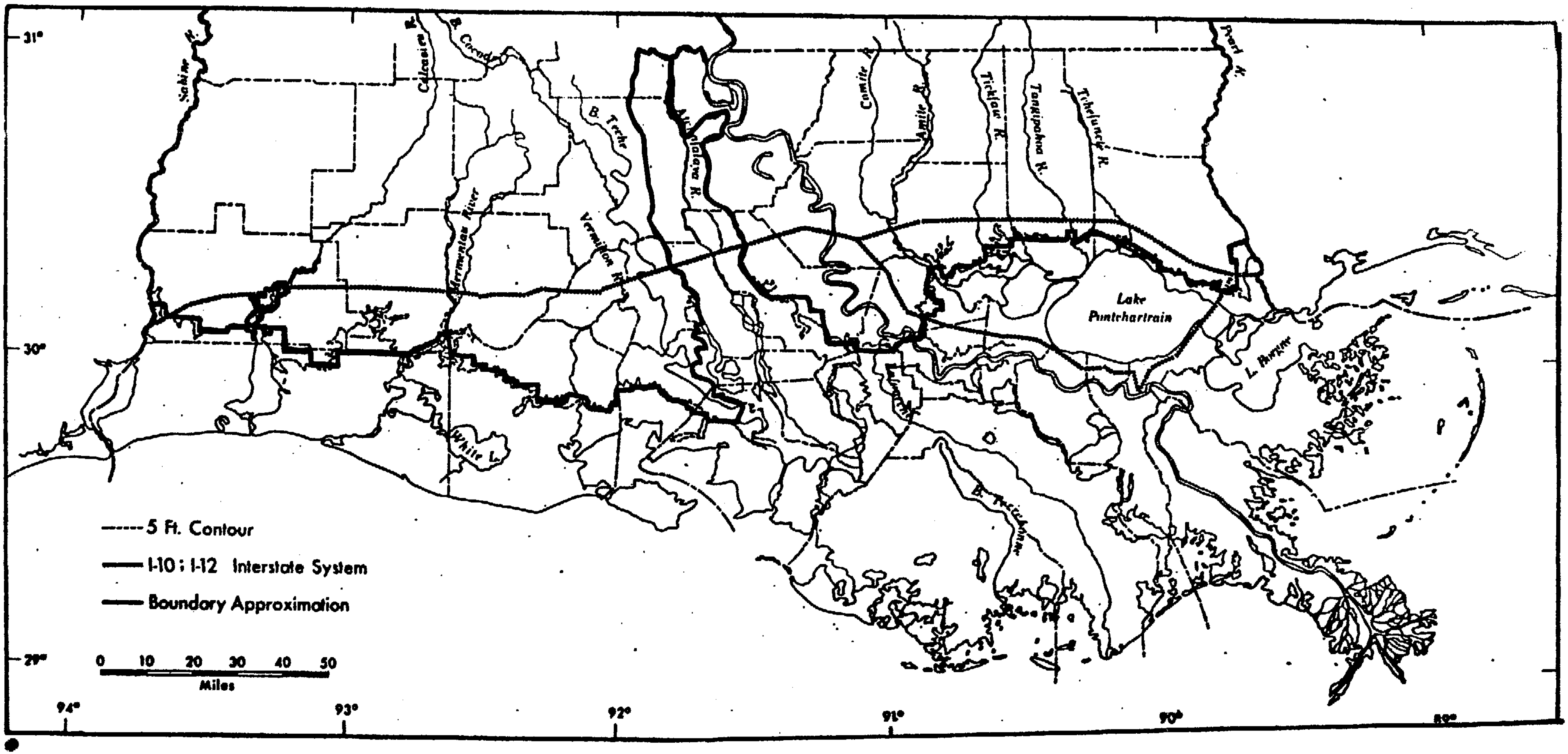
Legal/Governmental

1. Lateral Boundaries
2. Seaward Boundary
3. Inland Boundary
    a. Hundred-Year flood elevation line
    b. Storm surge reference line
    c. Coastal Zone Management Act requirements
    d. Federal Constitution requirements
    e. State law requirements
    f. Miscellaneous

Source: McIntire *et al*., 1975: 1-11.

FIGURE 5.1

BOUNDARY OF THE COASTAL ZONE OF LOUISIANA



Source: McIntire et al., 1975: 3.

TABLE 5.4

PHYSICAL PROPERTIES GOVERNING PRODUCTIVITY

OF ESTUARINE SYSTEMS

1. Confinement
   a) provides shelter that protects estuary from wave action
   b) allows plants to root
   c) allows clams to set
   d) permits retention of suspended life and nutrients
2. Depth
   a) allows light to penetrate to plants on the bottom
   b) fosters growth of marsh plants and tideflat biota
   c) discourages oceanic predators which avoid shallow water
3. Salinity
   a) freshwater flow may create a distinct surface layer over saltier, heavier bottom layer, indicating beneficial stratified flow
   b) fresh water dilution deters oceanic predators and encourages estuarine forms
4. Circulation
   a) sets up beneficial system of transport for suspended life when stratified such that the bottom layer flows in and the surface layer flows out
   b) enhances flushing
   c) retains organisms in favorable habitats through behavioral adaptations
5. Tide Driving Force
   a) transports nutrients and suspended life
   b) dilutes and flushes wastes
   c) tidal system acts as an important regulator of feeding, breeding, etc.
6. Nutrient Storage
   a) trapping mechanisms store nutrients within the estuary
   b) marsh and grass beds store nutrients for slow release as detritus
   c) richness induces high accumulation of available nutrients in animal tissue

Source: Clark, 1974: 2.

elaborates on the relationships described by Clark that occur among the marsh, sediment, and water in one estuary system, the Barataria. This estuarine area is located near New Orleans and is of great interest because of its high productivity and its proximity to an expanding urban area. Day's study confirms the intricate and fragile nature of an estuary that is part of a system that, according to Perret (1971), provides for 75 percent of all fish and invertebrates and 90 percent of the eight most abundant fish and invertebrates that inhabit Louisiana's coastal waters.

Destruction of the Coast

Studies by Gagliano and van Beek (1970), Craig and Day (1976) and others have indicated that Louisiana is gradually losing its productive estuary system. Currently, 16.5 square miles of wetland disappear each year under the Gulf of Mexico. Many estuaries are experiencing the effects of man's activities in the form of altered salinities, water pollution, elimination of sediment and detritus, and other factors. These studies and others have alerted governmental officials and, to some extent, the public, to the need for a management program to retain the valuable resources that Louisiana and many other states currently possess and which are now under attack. With this in mind, the following section of this chapter will propose a model for developing just such a plan. This model, hopefully, will enable states like Louisiana to strike a balance between man and nature, thereby preserving a valuable resource for future generations.

A MODEL COASTAL ZONE MANAGEMENT PROGRAM

The purpose of this section is to discuss various aspects that should be considered in developing a coastal zone management process. These concerns should be identified, discussed, and integrated into the final decisions regarding coastal areas. All of the aspects discussed will be tied together in a framework for a model state CZM program.

The impetus of most of the coastal zone management act-activities in the United States is The Coastal Zone Management Act of 1972.

The 1972 Act was designed to encourage states possessing a coastal zone to develop management plans, thus enabling them to deal more effectively with problems inherent in coastal areas. According to Armstrong *et al*. (1974), the Federal Act presents the following objectives for consideration by the various coastal states:

1. A clear intent to raise the level of consciousness at all levels of government regarding the importance of the resources of the coastal zone, and the need for their balanced management;
2. The need for states to understand and articulate the impacts that can result from various uses of the resources, and to understand the short and long term consequences of such impacts on the coastal zone;
3. The need to minimize adverse impacts;
4. The need to broaden and diversify the decision-making process to include a spectrum of those affected by management decisions.

This Act further focuses on a management <u>process</u> rather than substantive elements to be included in a CZM program. First the process is developed and then implemented.

In too many instances, states had little or no management of their coastal areas, which led to overuse and squandering of coastal assets for the sake of short-run economic gain. "Balanced Management" encourages uses of the coastal zone which neither destroy the wetlands and what they produce, nor eliminate the economic, recreational or social potentialities which exist in a given area. The Act, in a sense, is "environmentalist" legislation, for it points out that the natural ecological systems are valuable to man and worth protecting. By aiding in identifying and minimizing adverse impacts this Act will hopefully educate citizens who live in coastal areas as to the wisest use of the <u>renewable</u> resources that surround them.

Considerations of a Model Coastal Zone Management Plan

Basically, there are five broad areas that should be considered and weighed in developing a process for developing the coastal zone. These are:

1. Ecologic System--The natural system and man-induced stresses.
2. Economic Considerations--Current economic uses in the coastal zone and projected future needs.
3. Political and Legal Considerations--The political climate, laws and bureaucracy necessary to deal with CZM public participation.

4. Social Considerations--Impacts of CZM on various age, income, racial groups and means for handling public participation.

5. Aesthetic Considerations--The future of the visual scenic assets of the coastal areas.

These five areas will be discussed and elaborated upon in subsequent sections to provide planners with a broad perspective upon which to achieve "balanced management" of the coastal zone.[1]

Ecological Considerations

The Natural System

One of the reasons that the coastal zone has deteriorated is ignorance of the natural system--how it functions, and the services it provides. The following is a set of ecologic principles that hold true to a greater or lesser extent in all estuarine systems.

1. Ecosystem Integrity--No one part of an ecosystem operates independently of any other.
2. Linkage--Water provides the essential linkage of land and sea elements of the coastal ecosystem.
3. Inflow--The natural volume, pattern, and seasonal rate of fresh water inflow provides the optimum ecosystem function.
4. Basic Circulation--The natural pattern of water circulation within basins provides for optimum ecosystem function.

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[1]It may be noted here that administrative factors and the logistics involved in assembling and implementing a CZM plan are purposely left out. It is felt that each state has different organizational systems and may wish to route the process differently.

5. Energy--The flow and amount of available energy governs life processes within the coastal ecosystem.

6. Storage--A high capability for energy storage provides for optimum ecosystem function.

7. Nitrogen--Productivity in coastal waters is normally governed by the amount of available nitrogen.

8. Light--The natural light regime provides for optimum ecosystem function.

9. Temperature--The natural temperature regime provides for optimum ecosystem function.

10. Oxygen--High concentrations of dissolved oxygen provide for optimum ecosystem function.

11. Salinity--The natural salinity regime provides for optimum ecosystem function. (Clark, 1974: x-xi)

Whether it be Louisiana, Maine, Florida, or any other coastal state, the study of a state's coast can be approached by investigating the following parameters:

1. Geologic History and Current Geologic Activity;

2. Geomorphic History--In the case of Louisiana, the alluvial morphological features created by the Mississippi deltaic system as well as erosional processes would be prime studies;

3. Climatological Data--Precipitation, temperature, winds, the effect of tides on the coast, the effect of storms on the coastline.

4. Biological Considerations--Detailed studies of plants, terrestrial animals, birds, reptiles, freshwater and marine fish and invertebrates, their habitats, and interaction in the coastal zone.

5. Chemistry--Water chemistry and the biochemical energy flows through the system; also salinity regimes.

6. Ecological Overview--The tie-ins between all of the processes so as to explain the operation of the system.

At first it may seem difficult to gather all the required information to adequately consider the ecological parameter of the decision making process. However, each state has agencies, universities and private groups that are engaged in basic research in these areas. In Louisiana, for example, a partial list of suggested agencies or groups to aid in this task are:

1. LSU System
   a. Coastal Studies Institute (LSUBR) biological, morphological processes in coastal zone;
   b. State Climatologists (LSUBR) statistical weather, information, pollution;
   c. Geology Department (LSUBR) geology
   d. Urban Studies Institute (UNO) regional, social, political, economic, and environmental planning;
   e. Sea Grant Legal Program (LSUBR) legal aid, coastal law;
2. Louisiana State Agencies
   a. Wildlife and Fisheries Commission wildlife inventories, habitats, monitoring pollution;
   b. Stream Control Commission chemistry of water pollution, water quality;

3. Federal Agencies
    a. U.S. Army Corps of Engineers
       general inventories, hydraulic studies, mapping, flood control;
    b. U.S. Soil Conservation Service
       soil mapping and use suitability descriptions;
    c. National Marine Fisheries
       fish populations, commercial catch, migration, monitoring;
    d. National Oceanic and Atmospheric Administration
       Ocean processes and weather information
    e. Environmental Protection Agency
       environmental standards, technical information, legal information;

4. Private Groups
    a. Audubon Society
       bird studies, general information;
    b. Sierra Club
       general information;
    c. Louisiana Wildlife Federation
       general information; preservation, restoration of wildlife and other natural resources;
    d. Private Consulting Firms
       general information;
    e. Fishing and Hunting Clubs
       wildlife statistics, generation information.

These agencies and groups could assist planners in describing the natural system and, soon to be discussed, evaluating impacts on that system. The eleven ecologic principles discussed previously can then be modified and elaborated upon, to fit the individual system under study.

Adverse Impacts

After investigating the coastal zone, it soon becomes apparent that nowhere is the system operating in its natural state. Louisiana is no exception. Here, as elsewhere, man's habitation and use of coastal areas have resulted in a multitude of impacts on the natural system, many of them harmful.

One major problem is human habitation in delicate coastal areas. Modern man's living spaces, mainly cities, require extensive modifications to the lowlying, generally flooded estuarine lands that are currently inhabited. Mumphrey *et al*. (1975) has enumerated three basic effects of urbanization on wetland estuarine areas. These are water pollution, reclamation, and channelization.

1) Water Pollution

Water pollution can be generated by urban runoff, point source discharges from industrial plants, polluted rivers, among others. This polluted water contains heavy metals, exotic nonbiodegradable chemicals, and poisons such as herbicides, pesticides, defoliants. Fertilizers in the form of sewage or inorganic nitrogen substances speed up eutrophication processes by increasing nutrient content in small water bodies. These substances interfere with life cycles and chemical cycles of water. The system has evolved over millions of years to its optimum state, ecologically. Water pollution stresses this system. The city of New Orleans, for example, a city located entirely within a dynamic coastal zone, must pump all of its drainage water into two productive estuarine systems which it straddles. The city has become a "bathtub," i.e., subsidence of its land has caused the city land to sink below sea level, necessitating levees to keep water out (Wagner and Durabb, 1976). On the average over 11.1 billion cubic feet of water fall on the city each year. This results in a large volume of polluted runoff being pumped into a system that has difficulty handling it. A study by Craig and Day (1976) has indicated that eutrophic conditions already exist in the upper portion of one of the estuaries New Orleans straddles. This condition is traceable, in large part, to drainage water from the New Orleans Metropolitan Area and is merely one of many stress situations resulting from water pollution.

2) Reclamation

Another result of urbanization, rural settlement, agriculture, or most of man's other activities in the coastal zone is reclamation. Reclamation directly removes land from the estuarine system. Some of the effects on the natural system are:

LOSS OF LAND TO THE ESTUARY

a. Loss of habitat for birds, fish, reptiles, etc.

b. Loss of nursery area for birds and fish

c. Loss of detritus to the estuary

d. Loss of nutrient input into the estuary

e. Drop in total productivity

f. Loss of freshwater

g. Loss of wetland to the ocean (Adapted from Mumphrey et al., 1975: 64).

Referring to the ecological principles outlined earlier it is noted that ecological principles 1 through 6 are abused in the reclamation process. Water flows are blocked; the production of detritus, the food of the estuary, is lowered; habitat and nursery area is destroyed; and wetland is permanently taken out of the system.[2] In some areas, this practice of reclaiming land from the estuary has proceeded on a large scale. As of 1972, for example, over 110 square miles of former estuarine wetland have been converted to urban land in the New Orleans SMSA (Mumphrey et al., 1975). Currently, there are other projects in the area that will increase the total even more.

3) Channelization

The myriad number of canals that have been dug for drainage, navigation, oil and gas pipelines, and logging

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[2]This is caused largely by subsidence which will be discussed more fully in a later section.

have extensively damaged estuarine areas. Some of the effects of channelization on wetlands are:

1. Interfering with sheetwater flow through the system;
2. Allowing destruction of marsh by wave action;
3. Reducing nutrient exchange with natural channels and marsh;
4. Decreasing large biologically productive interface of brackish water;
5. Causing increased salinities, resulting in plant deaths and resultant marsh erosion and land loss;
6. Destruction of marsh and interfering with nutrient exchange by spoil banks of dredged material.
7. Destruction of marsh by construction of channel itself (Adapted from Mumphrey et al., 1975: 93).

In Louisiana over 42,000 acres of wetland have been destroyed by construction of canals (Mumphrey et al., 1975: 82). Other negative effects of channelization have contributed to a land loss rate of 16.5 square miles per year in Louisiana.

There have been many studies which deal in detail with individual aspects of stresses on the ecological system of wetlands; they all more or less agree as to the damaging effects that man has had on the coastal zone. In Odum et al. (1974), there is a lengthy discussion on emerging new systems associated with man such as estuarines that are impounded, receive heated water, pesticides, or dredged spoil, etc.

Attempts are now being made to model the way whole estuarine systems behave when subjected to various man-induced stresses. It is hoped that quantitative models describing all inputs and outputs of a system experiencing ecological stresses can be developed so that the extent of ecological deterioration can be more accurately measured. Until this is done, reliance must be placed on qualitative descriptions and descriptive statistical procedures to measure ecological stress.

Results of Consideration of Ecologic Parameter

Once the studies covering the various aspects of the ecological framework have been completed, the following process should be accomplished at the state level:

1. Construction of an accurate albeit general picture of estuarine function and natural productivity;
2. Compilation of a list of general impacts;
3. Delineation of coastal zone boundaries;
4. General inventory of natural and man-made features in the coastal zone;
5. Establishment of "critical areas," "areas of concern," "management areas," "development areas," etc. in a final CZM Plan can follow.

Item 1/2--This is obviously the outgrowth of compiling and/or acquiring reports on the various natural parameters that compose the estuary.

Item 3--Once the functioning of the estuary is understood and lands essential to this function have been identified, the boundaries of the coastal ecosystem can be located. Any lands found not to be in the coastal zone due to extensive modification can be removed from the system classification. For example, a study done by McIntire _et al_. (1975) described the Louisiana coastal boundary (inland) based on twenty-one biophysical parameters that had been measured by previous studies. Legal boundaries made up the lateral and seaward boundaries of the coastal zone of Louisiana. This study used ecological system parameters to describe the important inland coastal zone boundary. The coastal zone is a natural system, and it should be defined as such if it is to be managed properly.

Item 4--Examples of inventories are studies by Burk and Associates (1976) and the U.S. Army Corps of Engineers (1973b). The Burk study inventories unique ecological features of the Louisiana coastal zone; the Corps study is a general environmental atlas of south Louisiana containing information on most activities in the coastal zone. These studies and others can be used to compile master inventories of all features in the coastal zone.

Item 5--All of the studies can be used together with other relevant information to develop land use zones in the coastal areas. These land use classifications will be developed and discussed later in this chapter.

Economic Criteria

Having addressed some general ecological guidelines that should provide input into the decision making process, economic considerations as they relate to state coastal zone management are now discussed.

Economics vs. Ecology: How Much Conflict?

From a brief scan of the impacts that have occurred on wetlands and are continuing to occur, it appears that many economic activities in coastal areas are incompatible with the natural system. Rettig (1974) has described combination of activities that can occur in a given area. Relationships may be of two general types, symmetrical or asymmetrical. In symmetrical relationships, activities may be mutually competitive, mutually complementary (cooperative) or mutually independent (supplementary). In asymmetrical relationships, activity A may depend on activity B, but activity B may not depend on A or vice-versa. In other words, the mutuality of the activities does not exist. In coastal areas, classification of activity according to relationships between the economy and the wetlands would greatly aid in understanding stresses in the whole system. Using Rettig's classifications, activities could be listed as to their specific relationship to the wetlands. Since impacts on the estuarine areas are fairly well documented, the task at hand would be to relate these impacts to classes of activities occurring in a given area.

Land Use Projections

1) Current Land Use

One method of describing economic activity is to do a land use analysis of a given area, which involves mapping out commercial, industrial, residential, recreational, and other activities in terms of the amount of space they occupy. Having information on current land use is important because most of man's activities have an impact on estuarine areas, such as reclamation to make the land usable, channelization to aid in the flow of goods, services, and people into and out of the area, drainage of the land, and water pollution.

2) Population

Next, the population of a given area must be known. Table 5.5 lists the parishes in Louisiana wholly or partially in the coastal zone (as defined by McIntire et al., 1975), and the 1970 census populations. Using the "Cohort Survival" method of projection, the 1985 estimated populations were computed by Segal et al. (1976). As can be seen from this Table, over 50 percent of the population of Louisiana lives in the coastal zone. By 1985 this figure is expected to rise slightly. A look at individual parishes reveals areas like Jefferson will gain greatly in population (201,681 increase) by 1985. According to the U.S. Soil Conservation maps (1971a), 312 square miles of the 409 square mile land area of Jefferson is either undrained freshwater swamp, freshwater

TABLE 5.5

POPULATION IN THE COASTAL PARISHES*

Parish	1970 Population	1985 Projected Population	1970-1985 Increase in Population
Ascension	37086	51435	+14349
Assumption	19654	21182	+1528
Calcasieu	145415	161739	+16324
Cameron	8194	9817	+1623
Iberia	57397	67284	+9887
Jefferson	337568	539249	+210681
Jefferson Davis	29554	28432	-1122
Iberville	30746	30201	-545
Lafourche	68941	80731	+11790
Livingston	36511	52882	+16371
Orleans	593471	541964	-51507
Plaquemines	25225	29007	+3782
St. Bernard	51185	76986	+25801
St. Charles	29550	40206	+10656
St. James	19733	20073	+340
St. John	23813	28864	+5051
St. Martin	32453	36917	+4464
St. Mary	60752	59200	-1552
St. Tammany	63585	94455	+30870
Tangipahoa	65875	77800	+11925
Terrebonne	76049	95821	+19772
Vermillion	43071	46356	+3285
TOTAL	1,855,828	2,190,601	+334773
TOTAL Louisiana	3,641,306	4,183,112	

Coastal Parishes: Percent of Total La. 1970 Population: 51
Percent of Total La. 1985 Population: 52

Source: Segal et al. (1976) 56-209.
*Note: List of coastal parishes based on SPO definition of coastal zone (McIntire et al., 1975).

marsh, or saltwater marsh. This obviously puts pressure on the wetlands, since additional land must be reclaimed if such a population is to be supported.

By using the population data and employment projections, land use by type (residential, recreational, industrial, etc.) can be projected using several methods, the most common of which is the planned requirements approach.[3]

Economic Value of Wetlands

Using Rettig's classification, we find that some economic activities can exist in wetlands that do little or no harm to them. These activities have an asymmetrical relationship to estuarine areas, i.e., they depend partially or totally on the estuarine system, but the estuaries can function without them. All of these activities involve the use of renewable resources that the coastal areas provide. These include seafood and recreational activities because they stimulate economic activity (for example, boat sales for recreational use). The following is a partial listing of such activities.

1) Commercially Harvested Resources
   - a) Fish
   - b) Shellfish (Oysters, Clams)
   - c) Shrimp
   - d) Crabs
   - e) Crawfish, Lobsters
   - f) Furbearing Animals (Nutria, Muskats, etc.)
   - g) Reptiles (Turtles, Alligators, etc.)

[3]A future land use projection was done in Mumphrey _et al_. (1975: 170-189) for the Lafayette SMSA using economic base analysis, employment data, and the planned requirements approach.

2)	Recreational Activities	a) Boating b) Sportfishing c) Crawfishing, Crabbing d) Duckhunting.

Commercial fishing is a big industry in many coastal states. In Louisiana, it is a multi-million dollar industry. Commercial fishing (including all types--i.e., fish, shrimp, oysters, etc.) employs many people directly in Louisiana. Table 5.6 lists the ten leading states in the U.S. in terms of full-time and part-time commercial fishermen. As one can see from Table 5.6, all of these states are coastal states and most possess either an exceptionally large coastline or a well-developed estuary system or both.

In addition to jobs generated by actual fishing, there is employment in the processing-wholesale end of the industry. Table 5.7 lists employment in the processing-wholesale fish industry for the ten leading states in 1973.

In Louisiana, if we assume no change in processing and wholesale employment from 1973 to 1974, the total employment in fishing, processing, and wholesaling is 18,846 individuals. Obviously, there are others who also profit directly and indirectly from the fishing industry. Examples of this are the retail seafood markets, markets that handle seafood as a portion of their operation, and restaurants that depend on quantities of cheap seafood for their operation. This whole industry depends on a healthy, functioning estuarine system.

TABLE 5.6

FULL-TIME AND PART-TIME COMMERCIAL FISHERMEN,

LEADING U.S. STATES, 1974*

State	Full-Time Fishermen	Part-Time Fishermen	Total
Alaska	12045	8723	20768
Maine	7220	10581	17801
California	7682	6676	14358
Maryland	4500	9750	14250
Louisiana	9500	4050	13550
Florida	9850	2100	11950
Washington	3155	7696	10851
Massachusetts	4089	5815	9904
Texas	6500	575	7075
Virginia	3966	2283	6249
TOTAL	68507	58249	126756
U.S. TOTAL (50 states)	86699	82074	168773

*Ranked by total employment.

Source: National Marine Fisheries, 1975: 76.

TABLE 5.7

PROCESSING-WHOLESALE EMPLOYMENT

LEADING U.S. STATES, 1973*

State	Seasonal Employment	Yearly Average	Number of Plants
Alaska	10556	5500	227
California	9178	7547	152
Florida	6221	5440	405
Puerto Rico	6144	6037	5
Massachusetts	5707	4959	201
Virginia	5435	4011	196
Louisiana	5296	3624	226
Maine	5134	3421	235
Texas	4921	3293	160
Maryland	4035	3080	180
TOTAL	62627	46912	1987
U.S. Total (50 states)	93747	71723	3552

*Ranked by seasonal employment.

Source: Adapted from National Marine Fisheries, 1974: 79-80.

Another industry that exists in some estuarine areas is trapping for fur-bearing animals. In Louisiana, with its large expanses of wetlands, a large area of habitat is provided for many animals of commercial value. According to the Louisiana Wildlife and Fisheries Commission (1975), the value of pelts and meat obtained by trappers was $10,133,900 in the 1974-1975 season. This figure does not include value added by processing. (This figure was not available.) As with fishing, this economic activity relies on a healthy viable wetland system for its continued existence.

Tertiary waste treatment is a very important and often ignored aspect of the economic value of the wetlands. A study by Gosselink et al. (1974) indicates that:

> The most important contribution marshes and estuaries can make on waste treatment is to remove and recycle inorganic nutrients, a very expensive process...if carried out by man in artificial systems. When nutrient with effluents enter a marsh, the nutrients are effectively trapped by the tidal circulation pattern and assimilated in the productive biosystem. (Gosselink et al., 1974: 13)

In Louisiana, according to Mumphrey et al. (1975: 121) approximately 2.875×10^7 pounds/year of BOD (Biochemical Oxygen Demand) from domestic sewerage is dumped into the Louisiana estuarine system. Add to this the approximately 1.44×10^9 gallons per day of industrial effluent that are dumped into the system and it becomes obvious that the marsh is essentially providing a free service to the residents of the coastal zone.

The resources of the coastal zone provide for many recreational activities. The Louisiana State Parks and Recreation Commission (1974) has listed recreational activities with high participation rates in Louisiana. The following activities can be utilized in Louisiana's coastal zone.

Water Skiing
Motor Boating
Canoeing
Sailing
Saltwater Fishing
Tent Camping
Trailer Camping
Swimming
Crawfishing
Crabbing
Hiking
Picnicking
Nature Walks
Birdwatching
Driving for Pleasure
Sightseeing
Hunting Big Game
Hunting Small Game
Hunting Waterfowl

(Adapted from Louisiana State Parks and Recreation Commission, 1974: 2.2-2.3).

These activities require purchases of equipment such as boat and motors, sailboats and accessories, crab and crawfish nets, bail, fishing tackel, guns, ammunition, binoculars, tents, trailers, water skis, etc. These items are bought from local sporting good stores, boat sales, and bait and tackle shops, thus pouring dollars into the local economy. Such activities also depend partially or totally on the coastal zone's healthy status for their existence; they generally cause little or no damage to the system. It is true, however, that overuse in the estuary can damage these delicate lands. Pollution from boats and people, marinas (reclamation), roads into the wetlands (reclamation), deepening of natural waterways (channelization) can put added stress on the system. It is felt, however, that recreation puts only a minor stress on the ecologic system while bringing economic benefits to the area. Table 5.8 lists numbers of New Orleans businesses that deal with some aspects of recreational boating and other activities in the coastal zone. These are but a few examples of the many enterprises relying upon the estuary for their survival.

Based on studies by Gosselink (1974), Mumphrey et al. (1975), and others, values of wetlands have been estimated. Using the components of commercial fisheries, noncommercial fisheries, recreational activities and tertiary waste treatment functions, the total annual return from Louisiana's wetlands was $760,307,944 or $131.07 per acre. On a present value basis, this amounts to $2,975.63. It must be remembered that this production will continue more or less indefinitely if left alone.

Economic Costs of Wetland Development

Thus far we have looked at two components of our economic analysis. The first was activities that destroyed estuarine

TABLE 5.8

NUMBER OF RETAIL OUTLETS PROVIDING GOODS AND SERVICES

FOR USE IN COASTAL ZONE: NEW ORLEANS AREA

Type of Retail Outlet	Number of Retail Outlets
Boat Covers Tops and Upholstery	8
Boat Dealers	49
Sporting Goods	37[1]
Fish Nets (Retail)	7

[1]Some dealers deal exclusively with items not associated with the coastal zone (e.g. tennis).

Source: South Central Bell, 1975; authors.

lands. Next we looked at benefits derived from utilizing the system without destroying it (i.e., fishing, hunting, etc.). Now we will look at some extra costs associated with wetland development. These extra costs can be divided into three categories:

1. Subsidence Costs and Drainage
2. Protection from River and Hurricane Flooding
3. Loss of Buffer Against Storms

These three items cause the residents of reclaimed wetlands and nearby areas to incur extra costs over that which would ordinarily be expected.

1) Subsidence Costs

One extra cost of wetland development is that of subsidence. This cost accrues to all sectors of the economy: the homeowner, business sector, public sector. It stimulates increased spending in areas such as home maintenance, hurricane protection and drainage. Due to a general drop in land level the land is more vulnerable to severe flooding should the protective systems fail.

In Louisiana, the mechanisms that produce subsidence involve three basic processes. These include:

a) Geologic Downwarping and Compaction
b) Peat Decay and Water Loss
c) Drainage

a) Geologic Downwarping

Beneath the land mass of Louisiana there exists a large dip in the earth's crust termed the Gulf Coast geosyncline, the axis of which passes beneath coastal Louisiana. This axis area is very prone to active faulting as the earth attempts to adjust to the pressure of the 40,000 feet of sedimentary deposits that have accumulated over basement Mesozoic rock (Coastal Environments, 1972) during the millions of years that this system has existed. This faulting and general subsidence have resulted in slow geologic sinking of large portions of the coastal zone. Gagliano and van Beck (1970) have determined that the average subsidence rate for the coastal zone of Louisiana is 0.36 feet per century. This subsidence is not a result of man's activity and may not sound like much until one realizes that, with the exception of natural levee deposits, almost all of the coastal zone is less than five feet above sea level and the marshes and swamps are at or slightly below sea level. Any subsidence of this land can result in land loss, if there is no mechanism to keep pace with it.

Besides geologic subsidence, simple compaction of sediments over time results in a settling process that lowers elevations. Since man has severely restricted the ability of the Mississippi River to spread new sediments over its deltaic system lands by means of levees, land levels continually subside back into the Gulf of Mexico. Compaction and geologic subsidence have resulted in subsidence rates as high as two feet per century in St. Bernard Parish (Coastal Environments, 1972).

b) Peat Decay and Water Loss

Fortunately, there is a mechanism working in marshlands and swamps that can stabilize the land. This process is the slow accumulation of peat. Peat is partially decomposed organic matter that, due to submergence in water, has remained in a stable state. These deposits, over the years, can keep pace with subsidence if the rates are not too high. The results of this process are thick peat deposits in many of the older decaying distributary systems of the Mississippi.

When this type of land is drained, the water table is lowered and the peat begins to oxidize and literally disappear. According to Clement (1976) of the Soil Conservation Service, when oxidized, peat can lose 80 percent of its former volume. The same is true for the organic clays, although volume loss is lower. According to Coastal Environments (1972), this process has resulted in some areas of New Orleans sinking to elevations of -12 feet m.s.l.

Besides peat decay, which is an ongoing process after the water table is lowered, initial land lowering is accomplished by removal of water from a wetland area. According to Colvin (1975), some marsh areas are as much as 70 percent water. Removal of this water will lower land levels in the reclaimed area because of soil shrinkage.

What effect does all of this have on human habitation of the reclaimed areas? The following description of a soil common in the wetlands around New Orleans illustrates some of the problems:

> Lafitte muck--This is a very poorly drained thick organic soil at low elevations. The surface layer is very dark brown to black organic material 50 to 100 inches thick which is underlain by semifluid gray clay...The water level is several inches above the soil surface most of the year... This soil will not readily support human foot traffic.
>
> If protected and drained...the soil will consolidate and shrink with a resulting loss in elevation of two or three feet within the first year after drainage. The organic layers may catch fire and burn when dry. Continued subsidence at a slow rate over a long period will occur until all organic material above the water table has been oxidized...Drainage ditches and levees are difficult to construct because of the semifluid nature of the organic layers. Levees constructed from the organic materials shrink and cracks form. The capacity of ditches is gradually reduced because of the continual subsidence of organic layers. Flooding may occur if pumps and levees fail. (U.S. Soil Conservation Service, 1970a: 70)

Besides the difficulties mentioned by the U.S. Soil Conservation Services, unequal subsidence can cause damage to streets, sewer lines, driveways, sidewalks, drainage lines, etc. Anything not supported by piles will suffer damage from the subsidence problem. A study by Earle (1975) determined that the average amount of money that a homeowner residing on reclaimed marshland (with the characteristics previously mentioned) will have to spend is about $120 per year on wetland related maintenance. A new large-scale development, Orlandia, in the eastern portion of New Orleans (New Orleans East, Inc, 1975) projects 50,000 households living on reclaimed marshland by the year 1990, when the development is completed. Using Earle's figure, this results in about $6,000,000 per year in extra maintenance costs that these

50,000 homeowners will have to pay because of their location. This figure does not include extra construction costs (pilings) and public maintenance costs (streets, sewer lines, etc.) that would also be higher in areas like eastern New Orleans. There are other costs involved, too, like extra fill to meet Federal Flood Insurance requirements.

c) Drainage

Since subsidence and below sea level conditions are the inevitable result of reclamation of most wetlands areas, there is an extra cost involved in keeping these areas dry after they are drained. In New Orleans, a city built totally in wetlands, a system of twenty-one pumping stations, 240 miles of canals, 1500 miles of drain pipes and 40,000 catch basins drain 55,085 acres of New Orleans (Sewerage and Water Board, 1975a). The average rainfall in New Orleans (57.85") amounts to 12.1 billion cubic feet of water, weighing 377 million tons. The system is capable of pumping out 25,000,000,000 gallons of water per day or enough to empty a lake of ten square miles eleven feet deep in twenty-four hours (Sewerage and Water Board, 1975a). With the torrential rainfall that occurs in the city, it is essential to have that kind of capacity. Most of the city is below sea level due to subsidence, so the water table must be artificially drawn down by the pumps. If they were turned off, ground water seepage would eventually fill up most of the city with water. The Sewerage and Water Board of New Orleans must maintain a 61,000 KW power station (enough power to serve a city with a population of 78,000 people). The separate system is necessary because, when the system was initially designed, it was decided to use 25 cycle power rather than 60 cycle power, making the power station incompatible with other power stations. The system is antiquated and subject to frequent breakdowns. Taxes levied to pay for all of this are insufficient to meet needs.

In 1975, revenue from the drainage tax amound to \$4,105,624; operating costs were \$3,441,876 and debt service was \$718,098 for bonds (Sewerage and Water Board, 1975b). Therefore, no drainage system funds could be expended for capital projects. With new wetland areas opening up for development, there are canals to dig and maintain, pumps to build, land to drain. All of these needs may result in increased taxes and charges. There is already a plan to float \$16,529,000 for bonds to enable capital improvements to begin. The 1975 annual report of the Sewerage and Water Board recommends a tax increase to remedy the problem of antiquated equipment and future needs.

2) Flooding from the River and Hurricane Flooding

Since the New Orleans area and the rest of the coastal zone of Louisiana were formed by deltaic deposition and over-bank flooding of the Mississippi River, these areas must be protected from the river if they are to be habitable. Projects like the Morganza Floodway, Bonnet Carrē Spillway, and Old River Control Structure are relief valves to keep the Mississippi River from uncontrolled flooding along its lower reaches. This is in addition to miles of levees along the river. All of this was needed to protect the urbanized areas of south Louisiana during the flood of 1973, a so-called "Project Flood." Other than these extreme conditions, which occur very rarely, the river is kept in its place by the elaborate flood protection system built by the U.S. Army Corps of Engineers.

Hurricanes are a different story. High tides from these storms together with waves put tremendous pressure on reclaimed subsided wetlands. A 100-year frequency storm like Hurricane Camille produced a 22.6 foot tide near where it entered land. New Orleans sustained $9,800,000 worth of damages, despite the fact that it was not directly within the path of the storm. A computer at the U.S. Army Corps of Engineers Office was programmed to simulate a direct hit of Camille on New Orleans. The result: 10 feet of flooding and 100,000 deaths (Orleans Levee Board, 1972). A study by Byrne et al. (1976) has shown that wave heights from a storm such as this would exceed 75 feet[4] in 100 feet waters off the Louisiana coast. Even with a new $327,000,000 hurricane protection plan, New Orleans

[4]Camille had an estimated top wind of 201.5 miles per hour and a central pressure of 26.61 inches, second lowest of all recorded hurricanes.

levees will only be +14 feet m.s.l. on the outer perimeter. If Orlandia develops there will be 150,000 more people living below sea level with only one levee between them and the sea. While a storm like Camille is a "100-year frequency storm," one must consider the consequences of flooding in low reclaimed areas from this and lesser storms, as a factor in the decision to reclaim in any wetland near the cost.

3) Loss of a Buffer Against Storms

A consideration directly relating to development of wetlands near the coast is the loss of a buffer against storms. Day (1976) and others have indicated that marshes and swamps serve to slow down tide rises and break the force of waves. If land is reclaimed too near the edge of the open water; or if, by development inland, extensive deterioration of marshes between people and the sea occurs, the levees protecting reclaimed land must take the brunt of the force of storm water unabated by marsh.

A summary of the economic costs that are incurred by development in wetlands reads as follows:

Extra Development Costs:

A. Subsidence--Homeowner and Business
   1. Maintenance
      a) Extra Landfill
      b) Broken Sewer Lines
      c) Broken Walks and Driveways
      d) Flood Damage

2. Construction
   a) Extra Foundation
   b) Extra Fill
   c) Extra Taxes and Bonds for Municipality to Pay Public Costs

B. Subsidence--Public
   1. Land
      a) Replacement and Maintenance of Streets, Other Public Works
      b) Replacement and Maintenance of Utilities
      c) Fill Materials
      d) Flood Damage

C. Drainage--Public
   1. Drainage Canal Maintenance
   2. Pumps and Pipes
   3. Extra Electricity for Drainage

D. Flooding Protection
   1. Levees
      a) Cost of Building on Wetland Sites
      b) Maintenance of Subsiding Levees
   2. Flood Protection Works
      a) Construction and Maintenance of Floodways
      b) Construction and Maintenance of Barriers

E. Loss of Buffer Against Storms

Judging Economic Criteria

Basically, we can divide economic activities into three groups, both of which are asymmetrical in their relationship to the coastal zone. Group I includes the exploitable activities of man. Some depend on the coastal zone, but it does not depend on them. These activities compete with the estuary and cannot coexist in the same place at the same time. Group II includes the asymmetrical activities that depend on the coastal zone, do not exploit or damage the ecosystem, and upon which the ecosystem does not depend. Group III lists activities that do not damage the estuarine system if practiced in an approved manner, but the ecosystem does not depend on them (see Table 5.9).

Summary

To summarize then, all three aspects of the economies of the coastal zone must be considered. These are:

1. Benefits of reclaiming the land, present and future land-use needs;
2. Benefits of maintaining the natural system;
3. Costs of reclaiming wetland.

Most of the data concerning these three factors is available or can be generated fairly easily. Almost all of the data can also be placed in monetary terms for easy comparison. Having such data available allows the decision maker to consider projected results of alternative courses of action.

Aesthetic Considerations

Aesthetic considerations are perhaps the most difficult to grasp and weigh in the decision making process because of their intangible nature. However, there is considerable impetus existing in the United States to consider the aesthetic resources in the coastal zone. Mann (1975) has listed federal legislation dealing with aesthetic resources. These are:

TABLE 5.9

MAN'S ACTIVITIES IN THE WETLANDS

Group I Activities*	Group II Activities*	Group III Activities*
Heavy Industry	Fishing (including processing)	Oil Extraction
Manufacturing	Trapping	Sulphur Mining
Most Commercial Businesses	Waste Treatment	Salt Mining
Recreational Areas (Parks and Playgrounds)	Recreational Areas (boating swimming, etc.)	Clay Mining
Housing Developments	Recreational (hunting, fishing, birding)	
Port and Shipping		
Tourism		
Oil Transport		
Shell Dredging		

Source: Derived by author.

1. Coastal Zone Management Act of 1972 (Sections 302b, 303a, 303b, and 306)
2. Natural Environmental Policy Act of 1969 (Section 101b, 2, 4)
3. Water Resources Planning Act of 1965
4. The Wild and Scenic Rivers Act of 1968
5. The Highway Beautification Act of 1965
6. The Historic Preservation Act of 1966

These acts deal in general and sometimes specifically with aesthetic considerations that should be part of any coastal zone management plan. The Coastal Zone Management Act of 1972 states:

> The Congress finds that the coastal zone is rich in a variety of natural, commercial, recreational, industrial, and aesthetic resources of immediate and potential value to the present and future well being of the nation (U.S. Congress, 1972: Sec 302b).

Aesthetic Resource Definition

It is necessary to attempt to define "aesthetic resource" so as to be able to identify such resources in the coastal zone. An aesthetic resource is a resource that appeals to the senses in a pleasing manner. This resource may be natural or man-made, be visual or nonvisual, and it may or may not have economic value. A man may decide to plant a tree in his backyard for a number of reasons--to provide shade, to increase property value, etc. First of all, however, he probably planted it because it "added" something to his yard. It pleased him--the shape, color, size of the tree. This man was providing himself with a resource--an aesthetic resource.

There are many such similar resources in the coastal zone appealing to a diversity of groups: the beach to a sunbather or swimmer, the salt spray to a fisherman, the wilderness to a nature lover. All have value and must be considered as part of any state CZM Plan.

Requirements

To be included in the decision-making process, aesthetic considerations must meet the following requirements:

1. They must meet the requirements of the 1972 CZM Act and reflect key related legislation such as the 1969 National Environmental Policy Act.
2. They must be comprehensive, to accomodate different perceptions and different resources in the coastal zone.
3. They must deal with man-made and natural aesthetic elements.
4. They must be consistent, but flexible, to deal with different situations.
5. They must be practical, to enable recommendations to be adopted by designated coastal zone management agencies.
6. They must provide assistance to political agencies of state and local governments in identifying tools to use in maintaining whatever aesthetic resources are deemed worthwhile (adapted from Mann, 1975: 3-4).

Under the requirements of the CZM Act, the aesthetic resource parameter must:

1. survey, identify, assess, inventory, and map aesthetic resources;

2. delineate geographic areas of particular aesthetic concern;
3. analyze adverse and beneficial impacts of uses which could be designated as permissible within the coastal zone by use, structure, and area;
4. deduce uses permissible without condition, permissible with conditions, nonpermitted entirely, permitted within certain areas (adapted from Mann, 1975: 4).

Using existing environmental inventory or executing new studies, aesthetic resources that are important, and activities or uses that could alter such resources in a detrimental manner would be identified. Local governments, individuals and groups can be especially helpful in identifying these resources because of familiarity with their regions and personal preferences. Once such a list has been compiled for a specific area, the decision maker would then delineate areas that are particularly sensitive as well as analyze all possible activities for which the areas under consideration could be utilized. The determination would then be made as to which uses and activities should be permitted or not in the area <u>if</u> the resource is to be preserved. Final judgment on the resource must await the weighing of all other parameters--economic, political, social.

In Louisiana, a partial list of resources with aesthetic value would include:

1. City Parks
2. Playgrounds
3. Historic Buildings

4. Scenic Boulevards
5. Man-Made Water Features
6. Tidal Marshes
7. Barrier Islands
8. Old Tree Groves
9. Overflow Swamps
10. Archaeological Sites
11. Beaches and Dunes
12. Scenic Bayous and Rivers
13. Mudlumps
14. Saltdomes
15. Historic Sites
16. Scenic Gardens
17. Virgin Forests
18. Cheniers
19. Bird Nesting Areas

<u>Legal and Political Considerations</u>

Before making decisions about the future of the coastal zone, attention must be given to legal and political parameters, two considerations that could "make or break" whatever plan that would eventually be devised.

Legal Considerations

There are several items that must be accomplished before a state coastal zone management plan could be adopted. These are:

1. conformity with essential elements of the Coastal Zone Management Act of 1972 and all other relevant federal legislation;
2. conformity with existing state and local statutes regulating uses in the coastal area;

3. identification of federal legislation that could provide legal support and/or money to help implement elements of a coastal zone management program;
4. creation of a strong state CZM statute that avoids, as much as possible, loopholes, vagueness, and contradiction so as to withstand legal suits;
5. coordination with already existing federal and state agency guidelines regarding activities in the coastal areas.
6. development of guidelines for local CZM plans.

Coastal zone management must be in conformity with the major provisions of the Coastal Zone Management Act of 1972. For example, section 306(e) of the CZM Act establishes as a requirement for federal funds that a state must:

1. establish criteria and standards for local government implementation;
2. direct state land and water use planning and regulation;
3. review for consistency (with the state CZM plan) all development projects or plans, land use regulations, etc. proposed at the state or local level. (Adapted from the Louisiana Advisory Commission on Coastal and Marine Resources, 1973.)

If the state does not fulfill these requirements, needed federal monies would not be granted enabling a state to carry out its proposed program. Since the U.S. Army Corps of Engineers and the Environmental Protection Agency (EPA) have vast powers in the wetlands already, it would be an easy step to reject a state program and force a state to submit to direct federal regulation.

Conformity also means that legal research should be performed to determine what laws exist at the federal level and how best to set up a plan to conform with laws and criteria based on laws to put the plan into practice.

A natural outgrowth of conformity is coordination. If all relevant legal statutes and already developed federal criteria regarding coastal uses and activities are known, then it may be easy to coordinate the state plan with these criteria. For example, EPA has set maximum allowable concentrations of toxic substances, other than biocides, in water. In its considerations of the water pollution parameter of the ecological system, a state plan obviously should develop criteria similar to that of the EPA. This is being done in Louisiana. The Louisiana Stream Control Commission (1973) devises water quality criteria for water bodies in Louisiana and submits these findings to EPA for approval. Thus, coordination and conformity are achieved between the state and federal agencies in the field of water pollution and water quality control. This type of process is needed throughout the entire spectrum of coastal zone management.

As part of the legal research into relevant federal legislation dealing with the coastal zone, important tools and additional sources of monies could also be located. Mann (1974) has listed several laws and programs that could be applied to aesthetic resource management. These were discussed earlier.

The wording of the statute to be adopted as a CZM law must be especially clear. As the task of CZM moves into the political arena, there may be attempts to undermine its provisions by vested interest groups. The fewer legal loopholes that exist, the easier it will be to implement the program. Clear wording will also help the courts decide the validity of any legal challenges that may arise.

In addition to clear wording, all state statutes must be brought into conformity with this act to avoid legal entanglements after passage. Even the state constitution may need revision if that is necessary to enable the act to take full effect. Failure to do this will lead to chaotic situations when opposition forces attempt to weaken the law.

Many parish governments may wish to develop their own CZM plans, allowing local leaders, who are more familiar with the conditions and problems of their area, control over the use of wetlands in their jurisdiction. In order to do this, local officials must have guide-lines and criteria from the state to insure that any local plan is in conformity with the aims of state and federal legislation. Development of local plans will enable the state managment agency to be freed of the many local problems that could be handled best by parish governments. Under this system, the state would promulgate general goals and specific criteria and guidelines for CZM management. The parishes would then adapt and modify, if necessary, these criteria to their local environments (subject to approval from the state).

Political Considerations

This parameter may well be the most important one. No matter how comprehensive and efficient a CZM plan may be, it can be destroyed by a hostile political climate. To forestall this possibility, local and state political leaders should be included, as much as possible, in the process of developing a CZM plan. Consideration should be given to the following tasks:

1. educating and fostering input from state and local political leaders;
2. identifying political opposition and various means to overcome it;
3. utilization of "carrot and stick" techniques to convince local leaders of the desirability of participation in coastal zone management;
4. placation of vested interest groups who stand to lose if a CZM plan is adopted;
5. education of the general population on the benefits of coastal zone management for them; solicitation of public interest pressure groups as a political counterbalance against increased opposition; holding of numerous public meetings with extensive media coverage to elicit as much public participation as possible in the plan;
6. including formal public participation in CZM plan development.

1) Education of Public Officials and Input to the Process

It is extremely important to present information to the people who will ultimately decide the future of the coastal zone. Seminars, community meetings, and private conferences could be used to dessiminate information pertaining to ecological, economic, and aesthetic considerations in the coastal areas. This also means widespread distribution of reports and findings witten for the layman so that state and local governmental leaders can avail themselves of information, and cannot claim ignorance or "secrecy" as a reason for not knowing about coastal problems. Such a procedure provides for input of political opinions to the management agency.

2) Identification of Opposition

By allowing input from the political sector in a state, one can determine the source of opposition and its reasons for being against the plan. This identification of the opposition allows the planning agency to seek compromises acceptable to both parties or, if particularly intransigent, to plan strategies to overcome opposition.

3) "Carrot and Stick Technique"

Most states depend heavily on federal money for many essential programs. Much money is available to the state to distribute to local governments for CZM planning if they qualify. Thus, the carrot. Alternately, there is the definite possiblity of federal control of the coastal zone should a state show no motivation in establishing a CZM plan. The federal government possesses the authority to control the coastal zone if local governments fail to manage it themselves.

It may be easier and more efficient for local officials to regulate their coastal uses and activities than to become involved in bureaucratic controls, which is the stick.

4) Placation of Vested Interest Groups

Vested interests, mainly landowners, sometimes resist "land use controls," probably the essential element of a state CZM plan. In order to forestall heavy opposition from these groups and to be equitable in the management process, incentives should be given to land owners in areas that may be declared "nondevelopable" or an "estuarine sanctuary," or any other classification that denies the owner of the land the option to do what he wants with it. This could be done by:

1. making such land tax-exempt;
2. swapping state land in other nonwetland areas;
3. paying for such land not to be developed;
4. purchasing the land;
5. long-term leasing of estuarine land;
6. transferring development rights.

These methods and others should be considered as a means of compensating owners for the loss of some development rights associated with their land. It might also be of use to point out that, in areas that are zoned, land use controls are for the benefit of the general public and are not designed specifically to hurt anyone.

5) Education of the Public and Public Participation

Besides educating political leaders, it might be wise to educate the public, especially the voters who have the ultimate power in any state. All reports should be made available to them and public hearings should be held at which public input would be elicited. Media campaigns to inform the public about the importance of coastal zone management could be used. In a recent survey by Pinkey and Pattersen (1976), it was found that, of the total sample of Louisiana residents, 57.3 percent questioned did not know of any problems in the coastal areas. 21.3 percent cited ecological problems, 13.3 percent cited hurricane flooding and the remaining 8 percent stated economic, legal, or political problems. It seems evident, therefore, that with over half of the population unaware of problems in the coastal zone, education should be a high priority item.

Public meetings can help identify public interest groups which are interested in working for coastal zone management, as well as identifying implementation problems, value systems, and needs of the general population. New ideas can surface from public sources previously unrecognized, thus helping to formulate additional goals and objectives in the final plan.

The public should also have a say in the conclusions and recommendations gleaned from the various information sources. Formal public representation in the internal management agency from the various sectors of the coastal zone should be allowed to vote on the various recommendations as they are put forth as well as make their own suggestions. The possibility of a referendum on these preliminary recommendations might also be considered. This presupposes that the public has been kept steadily informed as to what is being done regarding CZM in Louisiana so as to enable them to vote intelligently on the issues.

Public participation, education, political placation and information dissemination should enable the political sector and all segments of the public sector to effectively participate in the process leading up to the final stages of a state CZM plan. This process should include the formulation of goals and objectives, the passage of an entire act, and finally, the efficient implementation of the plan in the coastal areas.

A Decisionmaking Framework for the Coastal Zone

Having obtained information concerning the various parameters in a coastal area, the decision maker now must face the problem of deciding on a plan of action for managing the coast. This is especially difficult because of the diversity of activities and pressures that occur in estuarine areas. Some activities can be measured in dollars; some are non-quantifiable. Some activities benefit man; some benefit the natural system. Some activities benefit specific groups while ignoring the general population.

The question arises: how does one weigh the various activities and compare dissimilar uses? Normally, one uses a form of benefit-cost analysis to evaluate alternatives in a land use situation, but here the situation is confused. However, by inputing the various factors previously discussed, and including public and private goals, a set of meaningful general goals can be developed. Then, a benefit-cost model can be derived and used to make decisions about various projects based on data and the goals system.

Problems

Before any goals system or model is considered, it must be remembered that no model or goals statement is value-free. Nash, Pearce and Stanley (1975) have argued for criteria to judge evaluation techniques (models). They state that a good evaluation technique should:

1. reflect individual preferences;
2. be publically accountable;
3. be operational;
4. be cognizant of systems effect (Nash, Pearch and Stanley, 1975: 83).

What Nash, Pearce and Stanley are advocating is "value sensitivity analysis" (Nash, Pearce and Stanley, 1975: 83), i.e., allowing the decisionmaker to identify the underlying value set and test how the specific outcome presented reacts to changes in the value set. Just as one tests the sensitivity of alternative projects by varying discount rates, costs and benefits, so should one test "alternatives" sensitive to underlying value judgments. Thus, when one evaluates a specific decision or a general good statement on land use in the coastal zone, one should know:

1. one's own bias,
2. the bias of the techniques one uses,
3. the bias of the actors involved in land use decisions,
4. the bias of the federal legislation.

Bias in Federal Legislation

An argument could be made that bias exists at the source of coastal zone management, the enabling federal legislation. The CZM Act of 1972 was passed because it was felt that a valuable resource was not being managed properly. The Coastal Zone Management Act of 1972 requires that analysis of a state's coastal areas lead to the establishment of "geographic areas of particular concern" and a priority of uses in these zones (Armstrong et al., 1974). Several states which have already adopted CZM Acts have designated zones of restriction or control of land use. These include Florida, North Carolina, and California (see Douglas, 1973). In the U.S. Senate, hearings on the CZM Act, "areas of critical concern" were designated as areas where uncontrolled development could:

1. result in irreversible damage to important historic values, cultural values, aesthetic values, natural systems or processes;

2. unreasonably endanger life and property as a result of natural hazards of more than local significance;

Examples of such areas cited at the hearings included:

1. coastal wetlands marshes and other lands inundated by the tides,
2. beaches and dunes,
3. estuaries, shorelands, and floodplains of rivers, lakes and streams,
4. rare or valuable ecosystems.

Since the preceeding definition of "areas of environmental concern" includes landforms and systems that make up most of Louisiana's wetlands, it would seem that maintenance of the natural system is a high priority item (bias) in the eyes of the federal government and the Coastal Zone Management Act. Therefore, in any model developed to aid in land use and decision making, inclusion of a practical constraint to preclude or limit development that would unduly damage the fragile areas of the wetland ecosystem should be considered. Having already gathered data on ecological impacts, future land use, etc., it should be relatively simple to predict where pressures on wetlands will be the severest and to forestall reclamation if these wetlands are critical to the system.

Goals

At this point, the state agency "setting up" the mechanisms of coastal zone management should derive a system of general goals and objectives of the plan they intend to implement. These goals should include the practical constraint mentioned above, as well as a priority system of land uses and criteria. An excellent discussion of a model for a goals system appears in Mumphrey _et al_. (1975: 217-227). In this model, the value set used states that a desirable goals system should result in benefits for both the "haves" and "have-nots" while not worsening the position of the "halves." This situation introduces the concept of "equity"--the distribution of costs and benefits over groups--as another constraint toward a goals system formulation.

Besides equity, the goals system should have three other attributes according to Mumphrey. These are: efficiency, comprehensiveness, and implementability. Efficiency requires the maximization of net monetary benefits. Comprehensiveness requires that all segments of the communtiy be considered. Finally, implementability implies that goals should be feasible and a method for implementation should be presented. A logical sequence for developing a set of goals might be the following:

1. Consideration of _ecological system_ and impacts on it; delineating areas of environmental concern, management areas, developable areas based on the ecological system.
2. Consideration of _economic factors_, such as current land use; projections of future needs for housing, industry, etc. and where this will occur; consideration of economic costs of development.

3. Legal considerations, including requirements of federal legislation and agencies; conformity with all existing laws relating to coastal areas.
4. Aesthetic considerations, including all relevant federal and/or state criteria relating to the management of aesthetic resources; compilation of an inventory of aesthetic resources and impacts on them.
5. Political considerations, including awareness of the views of public officials, vested interest groups such as developers, landowners, and environmental groups; devising methods of reconciling differences between groups.
6. Public participation considerations, encouraging at all stages public input, opinions, aid; awareness of opposition at local and state levels.
7. Decisionmaker's value set, incorporating what the decisionmaker considers important, along with the opinions of other consultants; the bias of the enabling legislation, CZM Act of 1972, should be remembered.
8. Inclusion of an "equity" constraint. Remember the enabling legislation (CZM Act of 1972) and the thrust or bias of it.
9. Develop an in-house set of general goals for CZM.
10. Develop specific criteria for implementing goals.

A Model

After this process is completed, a model for evaluating individual projects should be considered. Benefit-cost models are commonly used to evaluate public projects; since all development in wetland areas depends on public projects being erected, a benefit-cost model should allow the decisionmaker to forecast the economic benefits and costs of a project and to whom they will accrue. This result can then be evaluated against the goals system already in place.

Mumphrey et al. (1975: 191-217) presents a capsule discussion of various benefit-cost models that have been developed, including the strong and weak points of each method and its suitability to the task confronting the decisionmaker in CZM. The most important part of the discussion is the development of a "Synthesis Model," or "Equity-Constrained Benefit-Cost Model." In this model, benefits can be monetary, quantifiable but nonmonetary, and nonquantifiable. Costs can be defined likewise. Benefits, therefore, are positive inputs of a project, while costs are negative inputs. These parameters are entered in an evaluation matrix (as developed by Mumphrey) which considers all costs and benefits and their distribution. The goals developed for a program (like CZM) state the desired distribution of costs and benefits. If the goals define a desired benefit as "preservation on critical wetlands," then proposed projects can be matched against this goal. Thus, the goals statement is incorporated into the model for decision-making.

A CZM Statute

Having developed goals, criteria, and a model for evaluation, a coastal zone management statute can then be written. The statute should address the logistics of a CZM program. These would include the establishment of a CZM agency responsible for regulating the program, creation of permitting fees, fines, etc. Once the thrust of the management program has been developed, then it can be decided in the political arena whether implementation will be on the state or local levels.

The Test

The final test comes when the statute is presented to the state legislature for adpotion. Attempts by lobbyists and others to weaken or change the legislation should be expected. If the bill's proponents have done their homework, and the legislature votes in good faith, then a comprehensive bill should pass.

Figure 5.2 illustrates diagramatically the proposed process resulting in a CZM law.

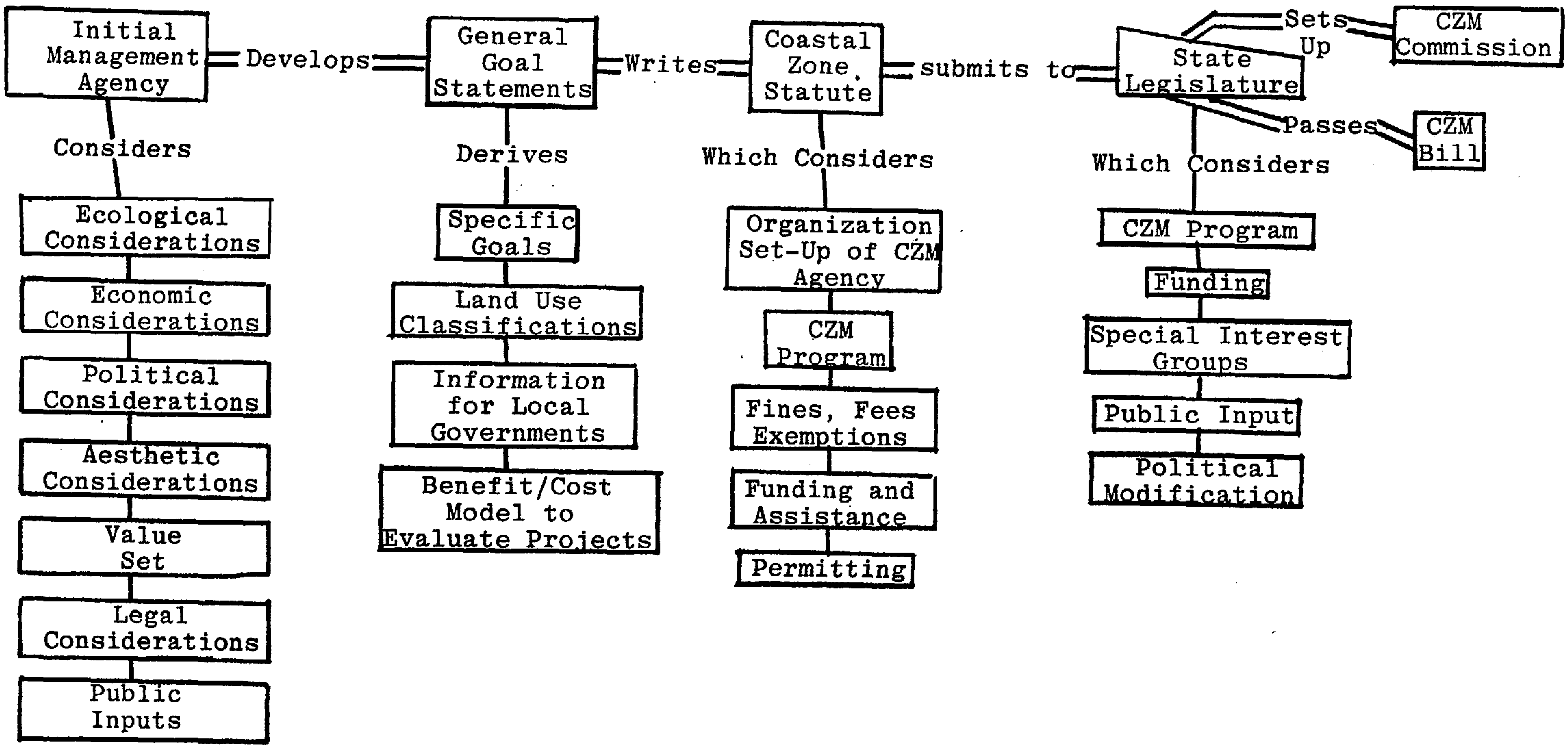
EVALUATING COASTAL ZONE MANAGEMENT PLANS FOR THE NEW ORLEANS SMSA

INTRODUCTION

The four parishes of the New Orleans SMSA--St. Tammany, Jefferson, St. Bernard and Orleans--are included in the coastal zone as defined by the State Planning Office. Under the proposed State Coastal Resources Program (Louisiana State Planning Office, 1976), "All state and local agencies are required to fully coordinate their activities affecting the

FIGURE 5.2

DIAGRAM OF MODEL TO DEVELOP A CZM PLAN



Source: Author

coastal zone with the management program established by this statute" (Louisiana State Planning Office, 1976: Sec 2008 C).

Furthermore, the proposed CZM statute provides that

> Local governments may develop a local coastal zone program in accordance with the requirements and procedures of...the state statute (Louisiana State Planning Office, 1976: Sec 2015 A).

One parish in the New Orleans SMSA has completed a CZM plan; another parish is in the final stages of developing a plan. The other two parishes have only just begun to consider developing local plans. This section, therefore, will deal primarily with the evaluation of CZM plans in the two parishes, Orleans and St. Bernard, which have concrete proposals. The evaluation will be presented from two viewpoints:

1. Evaluation under the proposed State Coastal Resources program; and
2. Evaluation under the model designed in the previous section.

The State Coastal Resources Program

Local Requirements

According to the proposed statute, local governments should:

A. Afford full opportunity for municipalities within the parish which have an interest in the uses of the coastal zone regulated under this act to participate in the development of the local program.

B. A local coastal zone program developed under this Section (2015) must be done with full opportunity for public participation and involvement of interested persons.

C. A local coastal zone program developed under this Section shall be consistent with the State management guidelines and with the policies and objectives of this act. It should consist of:

1. Reasonable modifications, amplifications, or additions to the state management guidelines which are necessary because of the peculiar local environmental conditions or user practices.
2. A description of the natural resources and natural resource users of the coastal zone area within the parish, the most pressing social and economic problems or needs within particular areas of the coastal zone of the parish and the general order of priority in which the problems or needs should be met within particular areas.
3. A description of the procedures used by local governments to make regulating decisions affecting users of coastal zone resources and to make public facility improvement decisions such as those relating to drainage, road improvement, flood protection, water supply, waste disposal and the like.
4. A statement showing the manner in which the regulatory and public facility improvements decisions set forth above include specific procedures and methods for considering the problems and needs within particular areas of the coastal zone within the parish and for considering the state management guidelines, and any local modifications, amplifications, or additions to them (Louisiana State Planning Office, 1976: Section 2015 A-D).

No local coastal zone program can take effect until it is approved by the Commission (set up in this act). Once it is approved, all public and private local uses (as defined by the act) must be consistent with the program established by local officials.

The above items are the qualifications that a local CZM plan must possess before it can be implemented under the provisions of this proposed act.

Goals and Objectives

As stated in the proposed legislation, the aims of the CZM statute are to:

1. encourage multiple use of the coastal zone resources consistent with the maintenance and enhancement of renewable resource management and productivity and the minimization of adverse effects of one resource use upon another;
2. to develop a coastal resource management program with full participation of state agencies, local governments and other persons which is based on knowledge of our resources, the environment, and the needs of the people of the state;
3. to develop a coastal resources management program with sufficient expertise, technical proficiency, and legal authority to enable Louisiana to determine permissable land and water uses of the coastal zone and to regulate the influence of federal agencies to a position of dealing with issues involving a clear national interest;
4. to ensure that the policies allow renewable resource management which alters the natural system in order to enhance particular plants and animals in a particular area (Louisiana State Planning Office, 1976: Section 2002 B).

This legislation will enable the state of Louisiana to:

1. define relevant terms relating to the coastal areas,
2. define the coastal zone boundary,

3. establish jurisdiction and assign agencies,
4. determine uses of more than local concern,
5. determine geographic areas of particular concern,
6. determine exclusions: uses partially in the coastal zone,
7. establish coastal commission membership, procedures, relation to local government, user groups, compensation, conflicts of interest,
8. establish an interagency advisory committee on coastal revenues,
9. provide for research, monitoring and advisory assistance,
10. provide recommendations for specific development projects,
11. develop a consolidated coastal use program,
12. establish criteria for decisions, appeals, procedures during emergency regarding permit program,
13. determine commission's action on appeals,
14. establish general permits,
15. initiate enforcement, injunctions, penalties, programs,
16. set use fees,
17. set effective dates and transition period (Louisiana State Planning Office, 1976).

Basically, the intent of this bill is to conserve the resources of the wetlands, minimize conflicts between competing uses, retain management control of these lands at the local and state levels, and streamline the permitting process.

CZM Plans Of SMSA Parishes

The four parishes that comprise the New Orleans SMSA encompass parts of two estuary systems: the Pontchartrain, Maurepas, Borgne, Catherine system and the Barataria system. According to the Louisiana State Planning Office (1975a), out of a total land area of 3,032,666 acres in these four parishes, 2,484,079 acres are classified as wetlands, water, or barren land. The U.S. Army Corps of Engineers (1975b) currently has 39 water resources projects planned or under construction in or near the SMSA for drainage, navigation, reclamation, etc. The area sustains an urban population of 1,094,388 persons (Jones and Denton, 1976). Coastal zone management is necessary, therefore, to maintain a balanced system of resource use. In this section the coastal zone management plans, if any, of each parish will be reviewed and evaluated by the two methods stated previously.

Jefferson Parish

Presently, Jefferson Parish has no coastal zone management plan nor are they working on one. However, Jefferson Parish has just recently decided that they will undertake the compilation of a coastal zone plan. According to Mr. Donald Terranova (1976), Principal Parish Planner, they expect to get under way shortly with the first phase of their plan. While some of the work will be done in-house, most will be done under contract to private planning consultants.

St. Tammany Parish

Mr. Craig Sinden (1976), director of the planning department of St. Tammany Parish, said that the parish has hired a planner to develop a local CZM plan. He is still in the process of acquiring other staff. Mr. Sinden said that he favors development for the parish, but wants balanced growth as a general goal.

Presently, the only land use restrictions in wetland areas of the parish are found in the St. Tammany Parish Comprehensive Plan--Land Use Regulations (St. Tammany Parish Police Jury, 1972). Section 2.2 establishes an "F District" that requires all floor elevations to be of a height "not less than one foot above the highest flood levels as recorded since 1921." Along Lake Pontchartrain, this translates to a height of not less than +8 feet m.s.l.

St. Bernard Parish

Mr. Angelo Chetta (1976), outgoing director of the St. Bernard Parish Planning Commission, said that St. Bernard has been active in coastal zone management since 1972, when the first phase of their CZM plan was begun. The impetus for their involvement was the impending construction of the Violet Ship Canal and Lock, which was considered by many in the parish to be detrimental to the environment.

Concerns of CZM

Since the CZM plan for St. Bernard is incomplete at the present time, Mr. Chetta outlined the main concerns that will be considered in the plan. These are to:

1. mitigate the adverse effects of the MRGO on the parish;
2. reclaim fresh and brackish water marsh areas (turned salty by the MRGO) for development and maintenance;
3. control shoreline erosion, especially on the eastern section of the parish;
4. establish "wetland zoning" and management areas to preserve and protect valuable wetlands;
5. limit <u>all</u> development to lands that are already behind levees or are in the process of being leveed by the Lake Pontchartrain, Louisiana, and Vicinity Hurricane Protection Plan;
6. upgrade Paris Road by designating it as part of an I-410 spur ending at Chalmette;
7. establish a new permit procedure for wetlands uses.

The Baseline Study

The completed part of St. Bernard's plan is the <u>Environmental Baseline Study</u> (Coastal Environments, Inc., 1972). The purpose of this study, as envisioned by the authors, is:

> to provide an environmental baseline of the parish as it currently exists, taking into account cultural and natural factors that have modified the landscape to this point in time. The study is intended to set management guidelines for the system and provide a basis for which future modifications to the environment can be judged with a high degree of predictability concerning probable impact (Coastal Environments, Inc., 1972: 2).

The study basically outlines the natural environment and traces the various impacts that man has made upon it and the result of these impacts. The final part of the study deals with geographical management units and management possibilities for the area under study. The purpose of management, according to the study, is to achieve an optimum relationship between use and conservation of an area's cultural and ecological resources. It should also ensure that the long-term use of a particular resource is an asset to the area. Various alternatives, including no management at all, are considered and their consequences assessed. The authors observe that this study is only preliminary, dealing with only part of St. Bernard Parish,[5] the urban portion that is now under critical development. Other studies are expected to follow which delve deeper into the possibilities raised by the initial work.

Orleans Parish

Of all the parishes in the New Orleans SMSA, Orleans has come closest to establishing a process for local coastal zone management. The staff of the City Planning Commission (1975) has completed a three-volume plan to manage the parish's remaining wetlands. The plan, however, has yet to be adopted by the City Council, which would give it the force of law.

Volume I states that the CZM Plan:

> was prepared to furnish the City of New Orleans with the initial means by which to control land uses and environmental quality within viable marsh areas. Through implementation, this plan should allow the City of New Orleans to attain the following goals:
>
> 1. the maintenance of a high level of quality within estuary areas in particular, and within the City of New Orleans in general;

[5] Currently, a second study of the entire St. Bernard Parish is being prepared by Coastal Environments, Inc., to be completed by October, 1976.

2. the formulation of land use policies and techniques appropriate to marsh-estuary areas;
3. the formulation of a means by which energy resources may be exploited without adversely impacting environmental quality;
4. the provision of adequate open space and recreational areas for the benefit of the citizens of the New Orleans Metropolitan Area, and the State of Louisiana;
5. to protect for perpetuity the economic and ecologic resources of the natural environment;
6. the efficient utilization of existing governmental agencies, in a coordinated fashion, in the management of sensitive environmental areas;
7. the establishment of land use guidelines and priorities in estuary areas (City Planning Commission of New Orleans, 1975: Vol. I, iii).

The three volumes of the plan provide an environmental inventory, assess impacts and bureaucratic machinery, and analyze alternative methods of management. Finally, there is a proposed statute for implementing the plan. In evaluating this document, the volumes will be taken individually and analyzed as to their effectiveness and compatibility with the proposed State Coastal Resources Program, the proposed CZM model, and against its own goal statements.

EVALUATION OF LOCAL PLANS UNDER THE STATE COASTAL RESOURCES PROGRAM

St. Bernard Parish

Problems in Evaluation

St. Bernard's coastal zone management program is difficult to evaluate for two reasons:

1. it is incomplete; and
2. the state coastal resources program is incomplete.

Since the St. Bernard Plan has not been completed, it is impossible to evaluate the thrust of the entire plan in anything other than a general fashion. Nor is the state coastal resources program complete. The only specific criteria that the state has presently are those delineating the boundary of Louisiana's coastal zone (McIntire: 1975) and (Harrison and Adams: 1976). Specific criteria for other sectors of the planning process are still being developed.

The statute proposed by the state deals with the process of managing the coastal zone. It has yet to be adopted. A weakened version of the original statute passed the state House of Representatives on July 17, 1976, and was sent to the Senate for further study. In this report, the St. Bernard and Orleans CZM plans will be evaluated under the proposed statute of the State Planning Office and not the House bill.

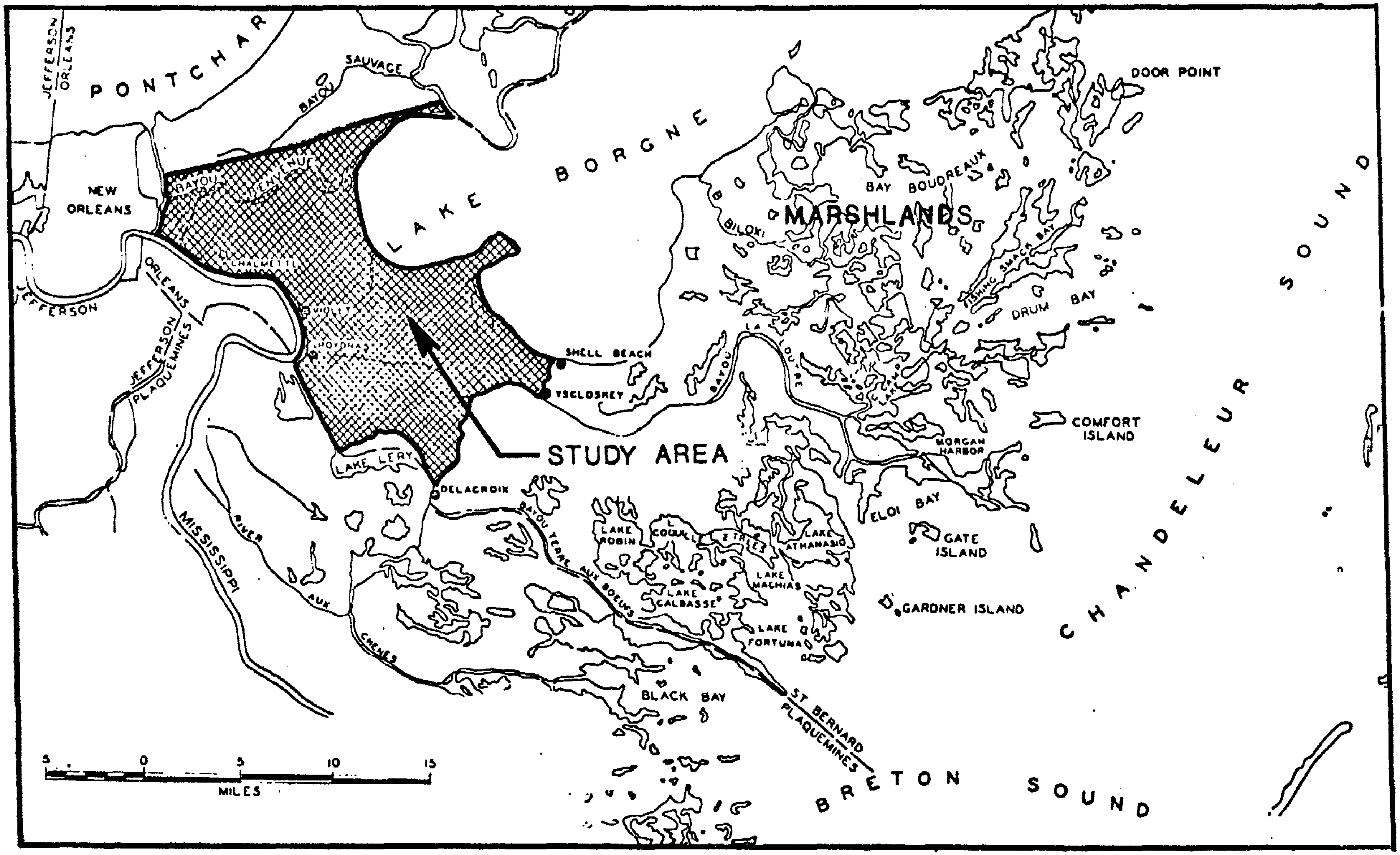
Evaluation

The St. Bernard Parish Baseline Study presents the following information:

1. an environmental inventory of the study area;
2. an overlay of the impacts of man on the natural system (see Figure 5.3 for the study area boundary);
3. separate management zones, based on the current ecologic conditions in each, within the study area;
4. a set of alternative management practices and their expected results if implemented.

FIGURE 5.3

BOUNDARY OF STUDY AREA, ST. BERNARD



Source: Coastal Environments Inc., 1972: 3.

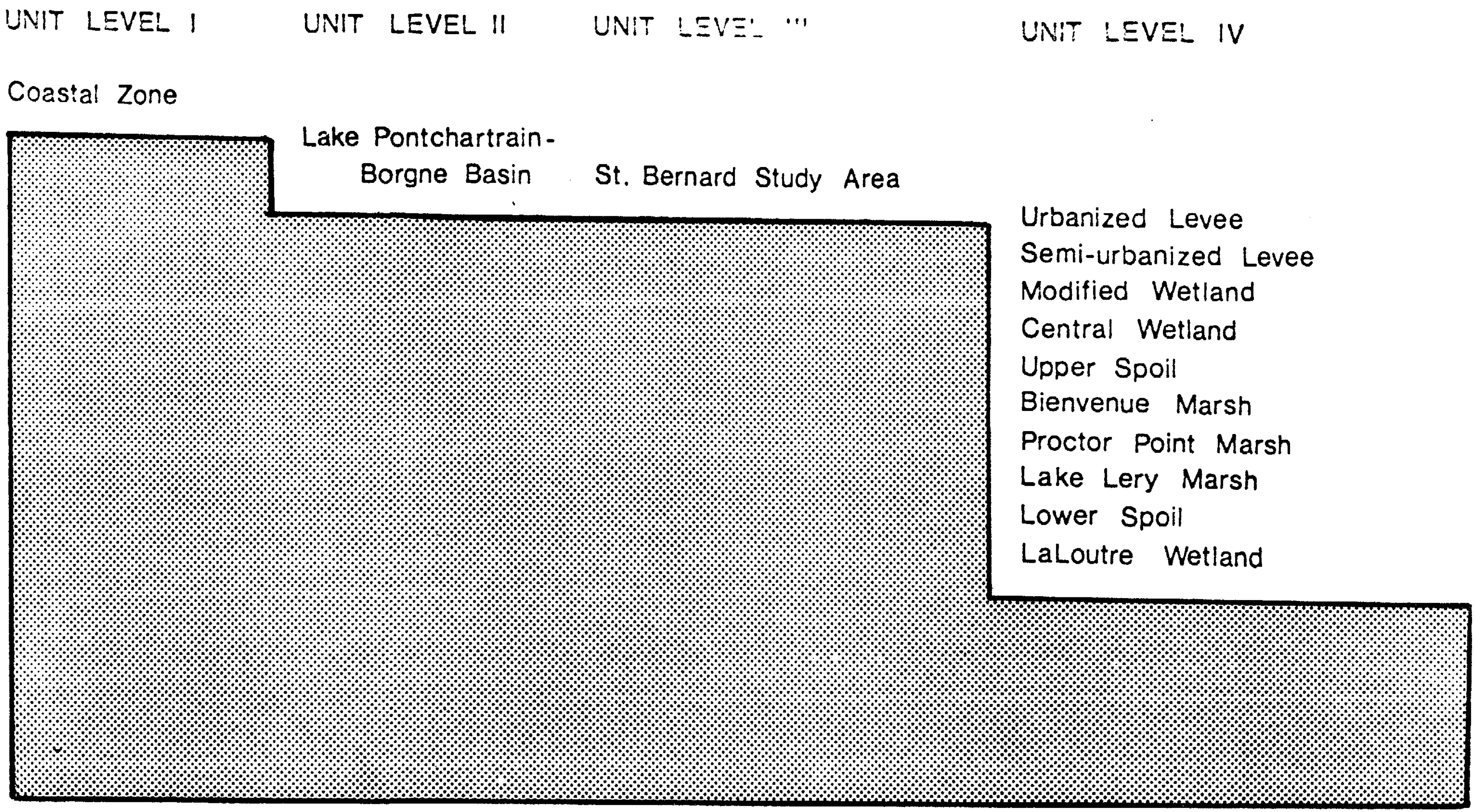
Section 2015 of the proposed state CZM statute specifically states that a description of natural resources be undertaken and problems identified. At the state level, studies by Burk and Associates (1975), the U.S. Army Corps of Engineers (1973a; 1975a) and others have provided detailed work that identifies ecological and cultural resources in this area of the coastal zone. As such, only general information is needed in a particular parish to supplement the data that the State Planning Office already has. A baseline study such as this one for St. Bernard "individualizes" a parish by showing how the processes work in a specific area. Unique problems of an area may also surface as a result of such a study.

As there were no criteria for management available from the State Planning Office when this study was done, the authors of the study established their own for the purpose of evaluating St. Bernard's plan. The management suggestions offered are admittedly only preliminary ones, but they do provide a framework on which to develop more comprehensive information (see Figure 5.4).

Section 2007 of the proposed state statute outlines the need for establishing "Geographic Areas of Particular Concern" for special management. The detailed breakdown of the St. Bernard study area is accurate enough to lend itself to a system of priority use and management based on classifications. Under current zoning ordinances, most of the viable

FIGURE 5.4

MANAGEMENT UNIT LEVELS



Source: Coastal Environments Inc., 1972: 125.

wetlands of the parish are zoned "A-1 Rural" (St. Bernard Planning Commission, 1971), a zoning classification that offers little protection for the wetlands it encompasses (see Figure 2.3).

Since this was a "baseline study," no consideration was given to the machinery or permitting process that would be needed to manage the area. Likewise, there was no "public participation" plan in this study, such as the one developed by the State Planning Office (1975b). The second phase of the plan (Coastal Environments, Inc., 1976) gives greater consideration to the process of implementation, but still does not consider the importance of public participation. Figure 5.5 illustrates the current level of conformity of St. Bernard Parish: CZM planning to date with the requirements established in the proposed state CZM statute for local governing bodies to follow.

Orleans Parish

Volume I

Volume I of the New Orleans CZM plan, entitled the "Technical Report," contains summary information relating to the geologic history, current environmental conditions, archaeological sites, cultural history, demography and economic conditions of the New Orleans area. This volume is comprehensible to the lay person and intended for general public distribution. The references used provide excellent background

FIGURE 3.5; EVALUATION MATRIX I

State Coastal Resources Program: Local Requirements		St. Bernard Parish Baseline Study
Opportunity for Municipalities within Parish to Participate in Development of Plan		○
Opportunity for Public Participation		○
Consistency with State Management Guidelines and the Policies and Objectives of the Act.	Reasonable modifications to state guidelines because of local conditions or user practices	N/A[1]
	Description of natural resources in parish	●
	Description of natural resource users	◗
	Social and Economic Problems and Needs	○
	General order of priority for needs to be met	○
	Description of procedures used by local governments to make regulatory decisions affecting users of coastal zone resources and make public facility improvement decisions	○
	Statement illustrating manner in which regulatory and public facility improvement decisions include specific procedures for considering: A: Problems and needs within particular area of the coastal zone	◗
	B: State Management Guidelines	N/A[1]
	C: Local Modifications (to guidelines)	N/A[1]

LEGEND:
- ● Total fulfillment of requirements
- ◗ Partial fulfillment of requirements
- ○ Requirements not fulfilled
- N/A Not Applicable

Source: Author

1) There has been no specific State Guidelines issued as yet for managing methods. The State Program is not proposed and, as yet, is incomplete.

information to support the summaries. This document, then, is written on a simpler level than the St. Bernard Environmental Baseline Study, which was intended to be a technical report for "in-house" use.

Demographic detail is provided in this report. Populations and their characteristics as well as trends in each of the planning districts of New Orleans are presented. This information gives the reader a general idea as to who lives where and which areas are growing, an important factor in coastal zone management. There is also a brief discussion of the economic conditions in the area, i.e., major industries, commercial bank deposits, construction employment, effective buying income, etc. This summary provides the reader with a general picture of what is important in the New Orleans economy.

The report recognizes that Orleans Parish is a part of the coastal zone, and as such concurs with the findings of McIntire et al. (1975) regarding the coastal zone boundary. By compiling an inventory and assessing the impacts in New Orleans, volume I complies partially with section 2015 of the proposed state statute. Otherwise, this volume is insignificant in relation to the state program.

According to the U.S. Soil Conservation Service (1970b), of the 199 square mile area of Orleans Parish, 175 square miles, or 88 percent of the total area, could be classified as having been originally marsh or swamp (before human habitation). Of that total, approximately 121 square miles of that total, approximately 121 square miles of wetland have been reclaimed, including the land behind the Lake Pontchartrain Louisiana and Vicinity Hurricane Protection Levee System (U.S. Army Corps of Engineers, 1973a). Much of the land area of Orleans Parish, therefore, has already been reclaimed for uses other than estuarine functions. The viable wetland that remains, about 54 square miles, is the main focus of the New Orleans CZM plan.

Section 2015 of the proposed state CZM statute contains the general requirements for a local CZM plan. Volume I of the plan, the technical report, accomplishes the intent of subsection C2 by describing the natural system, impacts on it, the users of the resources, and the economic and social conditions in the parishes. This volume, although general in scope, deals succinctly with the basic issues of the natural system. While written for the layman, it does rely, however, on several technical reports published previously.

Volume II

Volume II elaborates on descriptions offered in Volume I on the geologic factors that shaped the natural history of Orleans Parish and adds a time sequence. Marsh-estuary relationships are also briefly discussed, with emphasis on the current state of the estuarine area in the parish.

Based on information gathered earlier, the third section classifies wetlands in Orleans Parish according to their current ecological status. The following areas are delineated:

I Highly Urbanized Area

II Contained Marsh Area

III Nonurbanized Levee Area

IV Estuarine Marsh Area.

Boundaries for the four areas are described in the section. Within the Estuarine Marsh Area are "Critical Areas," defined as "those viable marsh and forest areas which should be preserved because of their value as recreational and economic resources" (City Planning Commission, 1975: Vol. II, 30). The critical areas are located mainly in the eastern section of Orleans Parish (see Figure 2.14).

Section IV of this volume discusses urban growth and the economic value of wetlands. Section V, entitled "Governmental Agencies Exercising Control over Environmental Quality," identifies those federal, state and local agencies with jurisdiction in coastal areas and those with research capabilities. These agencies are then integrated into a matrix relating their function to areas of concern in the coastal zone.

Section VI examines existing legal control mechanisms, the Municipal Code, Building Code, and Comprehensive Zoning Ordinance, that could be used in managing the coastal zone. The authors of the plan have proposed ammending the existing codes so that the following goals can be attained:

1. the provision of adequate open space and recreational areas for the benefit of citizens of the New Orleans Metropolitan Area;

2. the perpetual protection of the economic and ecologic resources presented by the natural environment;
3. the establishment of land use guidelines and priorities in the estuary areas (City Planning Commission, 1975: Vol. II, 53).

Currently there are no ordinances that deal specifically with problems of the coastal zone.

Section VII lists various alternatives for Coastal Zone Management. These are:

1. Urbanization without management
2a. Controlled development--without management
2b. Controlled development--with management
3a. Prohibited development--without management
3b. Prohibited development--with management.

After evaluating each of the alternatives, the staff considered alternative 2b the most feasible. This alternative would place restrictions in areas designated as environmentally sensitive and establish a program to maintain the areas. Figure 2.14 shows the areas that would come under the jurisdiction of this management plan.

This volume outlines environmental parameters, focusing on current conditions relating to land loss, flood control, faulting, soils and marsh-estuary functions. On the basis of this, Orleans Parish is divided into four areas. This volume complies, therefore, with section C2 of the state statute, which requires that areas of geographic concern be delineated.

In this volume the areas designated as "critical" coincide basically with the term "Geographic Areas of Particular Concern" in Section 2007 of the statute, since they have "unique and valuable characteristics," requiring "special management guidelines" to ensure a harmonious relationship between public and private interests.

The designation of "Geographic Areas of Particular Concern" should be a state responsibility, but since the state has yet to develop basic criteria for such designations the authors of the New Orleans plan created their own. Certain areas, which have been partially altered were designated as semi-critical.

The proposed New Orleans CZM plan contains a list of governmental agencies (federal, state and local) with control in the coastal zone, identifying their duties and objectives. Section 2010 of the proposed state CZM statute authorizes an Interagency Advisory Committee on Coastal Resources to "assist the administration, the Commission and local governments in the development of the Louisiana Coastal Resources Management Program and to facilitate close and continuing coordination between the coastal resources management program and other natural resources management programs affecting use of the coastal zone." This committee would identify and coordinate agencies with an interest in coastal resources. The State Planning Office has been gathering information on governmental agencies for some time. A report by Burk and Associates (1975) has identified major projects planned or under construction by federal, state, local or private interests. Appendix 1.1 of this study is a resource directory of persons interested in or influential in the coastal zone. This directory includes technical experts, special interest groups, and general interest groups. Because such information was not available when the New Orleans Coastal Zone Plan was developed, the authors had to compile their own list. as more information becomes available from the state, the list can be expanded and modified.

The next section of the CZM plan lists existing control mechanisms for regulating land use in the city and suggests amendments that would better regulate the coastal areas of the parish.

The section on management alternatives attempts to project various scenarios that could occur if each of the five suggested management alternatives were adopted. In the discussion of each alternative, general means for developing and implementing each course of action are suggested, and the results of that action are projected. The reader is thus able to follow the rationale of the authors in their designation of the most feasible alternative, 2B--Controlled Development.

This alternative states:

> 2B--Controlled Development. This alternative would place restrictions upon development and land use in ecologically sensitive areas and also provide for the development of an overt action plan designed to maintain and/or enhance natural systems (City Planning Commission, 1975: Volume II, 65).

Besides preserving the character of wetlands in eastern New Orleans by restricting development, alternative 2B embarks on a positive program to restore and maintain the natural resources that currently exist in the area.

Section 2002 B(1) of the proposed state CZM statute states legislative policy as:

> Encouraging multiple use of coastal zone resources consistent with the maintenance and enhancement of renewable resource management and productivity and the minimization of adverse impacts of one resource upon another.

Alternative 2B restricts but does not prohibit all uses of ecologically viable wetlands. It also fosters the development of a management plan that includes baseline studies, measurements, and a resource management plan for these areas. (See Figure 2.14 for boundaries of viable wetlands selected for management.)

Thus, there is a potential for <u>improving</u> these wetland areas, not merely adopting static use restrictions. The authors of the plan were realistic in their choice of areas to be protected. The partially-altered wetlands to the west of the management areas have already been substantially altered in the past. These lands could be considered "forest lands" or "areas surrounded by levees, already drained and substantially developed" (Section 2008 A(2)). These wetlands have been partially developed and surrounded by levees cutting them off from interaction with the estuarine system and making them freshwater areas instead of saltwater. Also, development pressure is heavy on these lands (for example, Orlandia). By protecting areas not yet under severe pressure to be reclaimed, there is more opportunity for legal mechanisms to be effective.

Volume III

This volume discusses problems that the urbanizing expanding city of New Orleans has created for the Pontchartrain, Maurepas, Catherine, Borgne estuary system that surrounds it. The problems are identified by area (see description of Volume III above), then the results of the problems on that area are presented. Some of the problems such as pollution from fishing camps can be corrected. Others, like storm water discharge into Lake Pontchartrain, will only increase as new lands are developed and drained. The solution to treating stormwater may be too costly for the city or state to implement. River pollution is mainly a task for federal and state authorities as the major impacts are not under the jurisdiction of Orleans.

Floodway problems in "fast" lands are discussed in some detail. These lands are not part of the coastal zone as they have been permanently altered and removed from the estuarine system. However, the problems of subsidence, and flooding of these former wetlands should be included as part of a coastal zone management plan because of the hazards included in inhabiting them after reclamation.

The recommendations for the nonfast lands in eastern New Orleans have both good and bad features. The idea of actually purchasing these lands is good in theory, but may be impractical if the money for the purchase is expected to be generated by local or state sources. The remaining restrictions sufficiently curtail intensive, damaging development.

In the discussion of soil conditions, five methods for developing the highly organic soils of eastern New Orleans are listed. Clement (1976) of the U.S. Soil Conservation Service has outlined what he considers the best procedures for minimizing adverse impacts of development of wetlands soils. These are:

1. drain down the water table;
2. allow oxidation, subsidence, compaction to occur for at least 25 years;
3. fill the land with at least enough fill to return to the original level of the land (in some cases, this could exceed ten feet);
4. raise the water table up to the fill and hold it there (to minimize any future decomposition of organics in the soil);
5. begin development.

This may be the best way but it is also the most expensive. Whether anyone could afford to develop land in this manner is highly doubtful.

The New Orleans CZM plan lists Clement's method as well as four others that would have cheaper first costs. These are as follows:

1. Use of a wet drainage method
    a. maintains water at a specified level
    b. allows land surface to subside to desired levels
    c. then fills land to desired level with mineral soil
2. Traditional dry method
3. Dry method but incorporating a waiting period until major soil subsidence has occurred
4. Dry method but requiring pumping six feet of river sand to expedite subsidence of soil and restore elevations.
5. Encourage other land uses for those sections that may subside greatly. (Adapted from New Orleans City Planning Commission, 1976, Vol. III, 7-9.)

Each method possesses certain benefits and costs that make it desirable. It is felt that, in the long term, the method described by Clement (1976)(similar to Method I of the plan) would cause the least problems for future residents of a reclaimed area.

Another serious problem discussed in the plan is soil erosion. According to Gagliano and van Beek (1970), rates of shoreline retreat as high as 13 feet per year were observed in the eastern New Orleans marshes. The average rate of retreat for the whole area was slightly less than seven feet per year. This erosion process is a "perfectly natural phenomenon" that occurs once an area no longer receives land building sediment from the Mississippi River system. Wave action and local subsidence (geologic) begin to take their toll and, eventually, most of the area becomes a shallow lake or bay instead of marsh.

The authors of the plan propose barrier islands of rip-rap or junk to forestall the action of waves. There is, however, little that can be done about subsidence. One can only keep a wetland healthy and hope that the peat accretion rate keeps pace with subsidence, something that apparently is not occuring in eastern New Orleans.

The final recommendations of the City Planning Commission are for legislative action on a CZM bill at the state level and fourteen suggested management measures to be adopted by the State of Louisiana.[6] These fourteen measures are all included in the current proposed state statute under consideration by the Louisiana Legislature.

Volume III, the "summary report," contains recommendations for implementating the proposals suggested in the CZM plan. To maintain a balanced environmental setting, the report lists four basic needs of New Orleans:

1. the need to expand the economic base of the City of New Orleans;
2. the need to provide additional flood protection for both residents and property owners of the City of New Orleans;
3. The need to retain and increase middle income families within the Central City area of New Orleans;

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[6]See Appendix 5.1 for complete listing.

4. the need to avoid the uncontrolled urban sprawl phenomenon (City Planning Commission, 1975: Volume III, 1).

The remainder of the report lists the problems and needs, with recommendations for remedial action. The report's complete list of problem areas are:

1. Lake Pollution
    a. Fishing Camps
    b. Storm Water
    c. Boat Discharges
2. River Pollution
3. Flooding
    a. Areas Outside the Levees
    b. Areas Within the Levees
    c. Flood Protection System
4. Wetland Development Pressures
    a. Expansion of Urban Development
    b. Expansion of Fishing Camp Developments
    c. Mineral Exploration Activities
5. Faults
6. Soil Conditions
7. Loss or Damage to Archaeological Sites
8. Erosion
9. Lack of Statewide Coastal Zone Management Legislation and Coordination (New Orleans City Planning Commission, 1975: Vol. III, 2-10).

In the epilogue it is recommended that the City Council:

1. use said report to guide and direct land use, development and capital program evaluation;
2. seek councilmatic approval to consider ammending the zoning ordinace;
3. pursue inclusion of necessary studies within the Coastal Zone Management study as well as studies called for by other agencies;

4. pursue funding sources for implementing recommendations contained in the report;
5. support necessary state legislation to implement the Coastal Zone Management Program for the City of New Orleans.

To support the proposed ordinance, the "Comprehensive Zoning Law of the City of New Orleans," a planned "CM-Coastal Management District" was formulated and listed in this section.

In the Appendix to Volume III of the CZM plan a proposed ordinance for instituting a "CM--Coastal Management District," with permitted uses, conditional uses, height, area, and bulk requirements etc., is outlined. To be consistent with the proposed state coastal resources statute, the uses governed by this ordinance must be in agreement with the "local uses" definition in the statute section 2006A (1-6).[7] An example of a local use would be a drainage or reclamation activity affecting 20 acres or less and intended to make land available for new industry, commerce, residences, etc. If, for example, a 1000-acre project were proposed for the eastern portion of the parish, within viable wetlands, it would be classified as a use of "more than local concern" due to its size. Private camps, piers, etc. in wetlands would be considered a local use.

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[7]Local uses, as defined by the proposed CZM statute, are those which:

> ...directly affect coastal waters such as those enumerated as uses of more than local concern but which are smaller in scale and affect only local interests (Louisiana State Planning Office, 1976: Sec. 2006A).

As long as the guidelines established by the state in sections 2005 and 2006 are met, there would be no conflict between the state and city over the establishment of land use guidelines in the newly created CM district. Figure 5.6 lists the proposed state guidelines for local governments and an evaluation of how well the New Orleans plan fulfills these requirements

Summary

The New Orleans Plan accomplishes the following tasks:

1. inventories the natural system, including geology, current conditions, archaeological sites, and cultural history, etc.;
2. describes current economic activities and social conditions in the city;
3. describes environmental characteristics of the area and partitions the area into management units;
4. discusses urban growth potentials;
5. lists governmental agencies with control in wetlands;
6. elucidates existing control mechanisms in the city of New Orleans that would be applied to wetlands management;
7. describes four management alternatives, proposed legal implementation, and the results of each of the alternatives;
8. recommends controlled development with a management program for the area;
9. lists environmental problems in the area and proposed solutions;
10. lists legislative recommendations and program recommendations to the state to facilitate cooperation and coordination of plans;

FIGURE 5.6: EVALUATION MATRIX II

State Coastal Resources Problem: Local Requirements		ORLEANS PARISH COASTAL ZONE MANAGEMENT PLAN: VOL. I, II, III
Afford Opportunity for Municipalities within Parish to participate in Development of Plan		N/A[1]
Opportunity for Public Participation		◗
Consistency with State Management Guidelines and the Problems and Objectives of the Act	Reasonable modifications to state guidelines because of local conditions or user problems	N/A[2]
	Description of natural resources in the parish	◗
	Description of natural resources users	◗
	Description of social and economic needs and problems	●
	General order of priority for needs to be met	○
	Description of procedures used by local governments to make regulatory decisions affecting users of coastal zone resources and make public facility improvement decisions	◗
	Statement illustrating the manner in which regulatory and public facility improvement decisions include specific procedures to consider: A: Problems and needs within particular areas of the coastal zone	●
	B: State management Guidelines	N/A[2]
	C: Local modifications	N/A[2]

LEGEND:
- ● Completely complies with requirements
- ◗ Partially complies with requirements
- ○ Does not comply
- N/A Not Applicable

1) There is only one municipality in Orleans Parish
2) There are no specific State Management requirements at this time

Source: Author

11. lists proposed ordinance for establishment of a "CM--Coastal Management District."

The City Planning Commission, therefore, appears to be in agreement with the basic features of the proposed state statute. The state has set no criteria, so New Orleans has had to set its own. The process established by the City Planning Commission to implement a local plan and coordinate it with the state program seems adequate enough to be successful.

The local plan addresses most of the concerns set out in its list of goals. Through implementation of the plan, goals 1, 2, 5, 6 and 7 would probably be attained. Goals 3 and 4 are more difficult to accomplish and are not directly in the scope of the CZM plan as it is now written. The drafting of this plan, however, is unique among the coastal parishes in the New Orleans SMSA. This plan has not been adopted, however, and does not have the force of law which is similar to the situation at the state level.

EVALUATION UNDER THE PROPOSED CZM MODEL

St. Bernard Parish

To avoid wasting time and limited funds, local coastal zone plans should complement, not duplicate, the CZM process at the state level. The St. Bernard baseline study complements the CZM process as proposed under the model very well. The baseline inventory supplements state data necessary for accomplishing results 1, 2 and part of results 3 and 5 of the ecologic parameter discussed above, and, therefore, is an excellent supplement to work that should be done at the state level. The baseline study and the goal statements illustrate that, at this point, the parish is headed toward a good CZM plan.

Orleans Parish

The Orleans Parish CZM plan provides an example for the other parishes within the SMSA of a supplemental plan that, functioning under a developed State Coastal Resources Program, could serve the purpose for which it was written. Under the model, a strong, viable program at the state level should already exist to provide structure, information, and assistance to the local governments attempting to manage their wetlands. The New Orleans Plan, however, was written with little guidance from the state (since no state program existed at the time). Therefore, the City Planning Commission had to do some of the work that should have been done at the state level.

Ecological Parameter

New Orleans considers itself to be in the coastal zone, using criteria developed earlier by investigators. Even though there was no formal statement by the state at the time the New Orleans plan was written, reports such as the Louisiana Advisory Commission (1973) have placed New Orleans within the coastal zone. Operating from that assumption, the proponents of the plan began to gather baseline data.

Volumes 1 and 2 deal, in part, with the ecological portion of a model CZM plan. An earlier section lists a number of such considerations. In Volumes 1 and 2 the New Orleans Plan accomplishes results 1, 2, 4, and 5 of the proposed model. The natural system and impacts upon it are discussed; a general inventory of the parish as to its cultural and natural features is provided; alternatives and tests for their efficiency in managing the wetlands are presented. The task of defining the coastal zone (result 3) has already been accomplished at the state level. It may be advisable at some future date to execute a formal baseline study similar to St. Bernard's for an indepth look at the environment but, keeping in mind that this report supplements an overall state plan, the depth of presentation is sufficient to be acceptable in terms of considering ecological factors.

Economic Parameter

Although there is no formal land use projection model developed in the plan, enough information regarding populations and the economy is presented to allow the reader to form a general picture of development pressures and where they conflict with wetlands preservation, these areas having been identified by means of four classifications (see City Planning Commission of New Orleans, 1975: Vol. II, 25).

It is felt, however, that an economic model for valuating wetlands such as the one developed in Mumphrey et al. (1975: 96-137) should be used in order to make land use decisions for the future. Economic benefits of wetlands (in their natural state) are briefly presented in the plan. A large segment of the public is not aware of the inherent economic value of wetlands. Therefore, greater stressing of this point could enable the proponents of the plan to gather public support for ultimate passage of the CZM proposals.

Insufficient attention is paid in the study to some of the economic costs of developing former wetlands. No mention is made of extra costs directly attributable to subsidence as well as to the precarious position that populations residing in such an area are subjected to in the event of a hurricane. The problems regarding drainage, flood protection and subsidence that will confront the city occur only after the decision to reclaim a wetland area is made. If the public was aware of the extra maintenance costs to themselves and the city, as well as their ultimate vulnerability to storms, there might not be a rush to buy land in the eastern areas of the city (former wetlands), thus easing some of the pressure on the viable wetland areas located near there. Unfortunately, not enough emphasis was placed on this argument against development in the plan.

Pollution in Lake Pontchartrain from storm water drainage is identified as a problem, yet the new Orlandia area will add more, not less, drainage water to the Lake. If Lake pollution from this source is serious enough to list as a major problem (City Planning Commission, 1975: Vol. III, 3), the CZM plan should carefully weight the costs and benefits of Orlandia regarding pollution; other considerations, including soil subsidence costs and the dangers of storm flooding should also be considered. The U.S. Army Corps of Engineers apparently feels that the Orlandia project is of sufficient impact to warrant further study. Decker (1976) has indicated that the developers of this project will be required to file an environmental impact statement before construction can begin.

A proper CZM plan should contain a benefit-cost model for the economic evaluation of wetlands, thus giving the decision-maker solid data on which to base his/her decision. Such an analysis would bolster the concept of coastal zone management.

Aesthetic Considerations

No attention is paid to the aesthetic resources of the coastal zone, except as they relate to the economy (i.e., fishing, tourism, etc.). This occurs despite the fact that the federal CZM Act of 1972 requires that the aesthetic parameter be considered. Schumacher (1973) and others have questioned the validity of attempts to reduce everything to its monetary worth. In too many analyses, that which cannot be valued monetarily is ignored. This CZM plan does not ignore all nonmonetary aspects of the coastal areas, but does not elaborate on the many aesthetic resources of the coastal zone. Perhaps this should be done at the state level. This was the first parish plan to be completed, and as such, is expected to be somewhat flawed. Failure to adequately consider aesthetic resources in Orleans parish is one of those flaws.

Legal and Political Considerations

Perhaps the strongest part of this plan is the attention it pays to the mechanisms to legally implement the recommendations suggested in Volume 3 of the plan. By proposing ordinances and amendments to the three existing control mechanisms in city government, a smooth transition to CZM enforcement should result, with a firm legal basis supporting it.

Political considerations are largely ignored in the plan. However, buying land and bringing it into the public domain is proposed as a method of preserving wetland areas. This tactic should result in placation of the landowners. The use of existing systems of control can avoid an additional bureaucracy. An increased bureaucracy would possibly be opposed by sectors in the political arena. The various possible political tactics discussed in the model to be used to pass the CZM plan must await the passage of the State Coastal Resources Program before any real pressure can be brought to bear on the local government for adoption of the New Orleans CZM plan.

Public Participation

The only formal mechanism for public participation in the New Orleans Plan is a set of formal public hearings by which public input can be solicited. The City Planning Commission (CPC) worked unofficially with several nongovernmental interest groups such as the Seirra Club, Ecology Center, and the

American Institute of Planners. These groups provided information used in the formulation of the report. However, they had no formal voting power or representation at the City Planning Commission when the content of the report was decided upon.

While more public participation (other than hearings) would be desirable in Orleans Parish, perhaps the mechanisms for such participation should be determined at the state level so that each parish can have guidelines as to how to include the general public directly in the decision-making process.

The authors of the plan admit that the primary guidelines for CZM should emanate from the state (Volume III, 10). After analyzing the plan, it appears that the plan has been designed to supplement a final state comprehensive resources program from the state (see Apendix 5.1).

Social Considerations

Although the plan describes social conditions in New Orleans, there is little else said about the impacts of Coastal Zone Management on various social groups. Obviously, these groups can make their opinions known during public hearings held to elicit comments on the plan. However, when the plan is reworked and rewritten, more attention should be paid to the inclusion of a section dealing with impacts of CZM on various social groups and the mechanisms for including them in the decision-making process.

Goals and Objectives

After analyzing Volumes 1, 2, and 3 of the New Orleans CZM Plan, it is unclear how the goals stated in the prefaces of the volumes were derived. It is clear that the goals apparently were determined beforehand and the plan prepared with the intent of achieving them. These goals and objectives follow closely the intent of the proposed State Coastal Resources Statute against which this plan has been evaluated previously. The plan accomplishes many of the goals and sets up the framework for achieving the rest. Under the proposed model, these goals, as well as general criteria and specific recommendations, should have come from the State. Again, since there was no state plan the city had to develop reasonable objectives themselves that followed what was thought to be the thrust of a future state program.

Conclusions

The New Orleans CZM Plan, intended as a supplement to a state coastal resources program, cannot be easily evaluated against the proposed model that has been designed to set up a state level process. Despite this fact, the New Orleans Plan does incorporate elements that are necessary for a local plan to possess. When the state has completed its work and gives the city more direction as to what, specifically, the plan should address itself, the New Orleans CZM Plan can be reworked and its flaws corrected. Considering that it is the first local wetlands managment plan completed at the parish level, it is considered a good, sound, and ultimately workable plan.

APPENDIX 5.1

Recommended Measures for the State Legislature to Implement CZM

Recommendation on State Legislation:

It is recommended that the State Legislature adopt Coastal Zone Management measures encompassing the following:

1. That the State's Coastal Zone Management Program consist of three programs: management, long range planning, and long range research, all under the supervision of a Coastal Resources Commission.

2. That the Coastal Resources Commission membership contain not less than ten (10) members nor in excess of fifteen (15) members.

3. That parish Chief Executive Officers be authorized to designate a representative to serve on the Coastal Resources Commission. Such designee so represented be granted full membership powers with respect to issues affecting his parish. That the local representative have an initial veto over any proposal affecting said parish, with the veto capable of being over-ruled by the Commission on appeal after a 30 day delay and public hearing within the parish so affected.

4. That the Commission be granted the powers to promulgate rules, regulations, criteria and standards to properly manage the Coastal Zone.

5. That no rules, regulations, criteria, standards, etc. be promulgated which would affect existing rules, regulations, criteria, standards, etc. governing previously leveed or drained areas.

6. That the Commission be granted the powers to establish goals, priorities, and objectives for the Louisiana Coastal Zone after input from local governing bodies.

7. That local governing bodies be authorized to formulate, inact, and enforce local Coastal Zone Management plans which are formulated, enacted, and enforced under State guidelines and supervision, and that such local plans be incorporated into the State Coastal Zone Management Plan provided that such local plans are consistent with the objective of the Act.

8. That the Commission formulate guidelines and supervisory procedures to monitor local governing bodies who would be granted the power to hear and rule on permit application.

9. That the Commission formulate guidelines and supervisory proceu ures to monitor local governing bodies who would be granted the power to acct and administer funds and grants.

10. That the Commission formulate guidelines and supervisory procedures to monitor local governing bodies who would be granted the power to acquire land.

11. That an office of Coastal Zone Management within the Louisiana Wildlife and Fisheries Commission be established to aid the State Planning Office with long-range planning functions and to aid Louisiana State University with long-range research projects concerning the State's coastal zone.

12. That all coastal zone regulatory functions be consolidated into a single regulatory agency.

14. That the authority vested in the Commission become effective only upon adoption of a Coastal Zone Management Plan (or part thereof) and upon adequate funding (both operational and capital) to permit plan implementation.

Source: City Planning Commission of New Orleans, 1975: Vol. III: 10.

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